WILDLIFE REVIEW

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WILDLIFE REVIEW

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CONTENTS

General conservation
Natural resources & climate 2
Soils 2
Conservation education 3
Bibliographies, directories, biography, history 4
Plants
General, ecology, techniques 5
Floras, communities, taxonomy ... 6
Forest surveys 8
Wildlife
New game series 9
Biotas, ecology, natural history. 9
Natural areas & refuges 10
Morphology, physiology, behavior, migration 11
Effects of chemicals, weather, cars, etc. 11
Parasites & diseases 12
Populations & fluctuations 14
Biometrics 14
Techniques 16
Management & research, general .. 17
Hunting areas & problems 19
Economic & other values 19
Food habits & techniques 20
Predation, crop damage, control . 20
Reports of organizations & reports of harvests 20
Management & ecology of habitats & animals
Wetlands & wildlife 22
Farmland & wildlife 23
Rangeland & wildlife 25
Forestland
Forestry & ecology 26
Management for & damage by wildlife 28
Stripped land & misc. habitats. 30
Control of upland vegetation with herbicides, etc. 30
Mammals
General 30
Faunas & manuals 31
Populations, home ranges, communities 32
Mammals
Parasites & diseases 33
Shrews, moles, bats 33
Rabbits & pikas 34
Rodents
Miscellaneous 37
Rattus & Mus 40
Sciurids 41
Beaver 42
Muskrat & nutria 44
Fur animals, general 45
Carnivores
Bears 45
Raccoon, ringtail, coati 45
Mustelids 46
Dogs, wolves, foxes 47
Cats 47
Big game
General 48
Deer (Odocoileus) 51
Marine 56
Other groups 58
Birds
General 58
Morphology, physiology, behavior, migration 58
Manuals, faunas, communities .. 61
Populations & fluctuations 62
Control, mortality 64
Parasites & diseases 66
Game birds—general 66
Quail 67
Pheasants 68
Grouse, partridge, etc. 71
Turkey 73
Doves & pigeons 73
Waterfowl 74
Cranes, rails, shorebirds 83
Other birds 84
Reptiles & amphibians 85
Fishes 89
Invertebrates 89
Vernacular names: W. L. McAtee's papers on ... 90-95
Author index 96
Notices 100

Except as indicated, abstracts are by William H. Stickel, editor.

NATURAL RESOURCES & CLIMATE

Archer, Sellers G. SOIL CONSERVATION. U. of Okla. Press. 305 p., 14 figs., 30 p. of photos. 1956. $3.75. [From review in J. Soil & Water Cons. 11(4).]
Considered a very fine book that is written in simple, direct, easily-understood terms. It is a guide to practical conservation. It contains excellent, up-to-date information on how to get educational, technical, and financial assistance. Should have great appeal to farmers and ranchers, business men, educators, and conservationists. Sections treat such topics as planning for conservation, handling of croplands and grasslands, farm forestry, special programs in conservation, and wildlife on the farm.

Butler, M. D. CONSERVING SOIL. D. Van Nostrand Co., Princeton, N. J. 321 p., illus. 1955. $3.96. [From review by Howard Mendenhall, J. Soil & Water Cons. 11(4).]
"This is a book that the professional conservationist might well suggest to the serious minded layman for reading. It contains many practical conservation suggestions, including the development of an integrated program for a local watershed." References for further reading are cited at the ends of chapters. Although designed as a text for agriculture teachers, the book has a place as a reference for any high school or college teacher in conservation. The volume might well have been entitled "Conserving Our Natural Resources." Much information is given on the meaning and techniques of soil conservation. Jobs are broken down as to season and weather. One chapter is devoted to grasses and legumes and a long chapter is devoted to trees. Ten chapters cover watersheds and their problems in regions of the U. S. "Throughout the book are many pictures, several diagrams and maps, plus some interesting graphs and tables in the appendix. After each chapter are many thought-provoking questions and suggestions of practical projects..."

Scott, Anthony. NATURAL RESOURCES: THE ECONOMICS OF CONSERVATION. Can. Studies in Econ. no. 3. U. Toronto Press. ix + 184 p. 1955. $3.25.
A professional but nonmathematical analysis of the meaning of conservation, reasons why it may be practiced, and financial and legal ways in which it can be promoted. The viewpoint is strictly that of the economist; ethical and esthetic factors are disregarded for the purpose of this discussion--conservation is considered only as it affects the economic welfare of man. Timber and mineral resources receive major attention, fisheries a little, soil a little, wildlife almost none. Data on conservation systems and their development in many countries are used. The author's intensely practical approach may repel many naturalists, but what he has to say should broaden and sharpen their thinking on conservation economics and place them in a better position to deal with practical problems and controversies. The book is suitable for such use because it is written in understandable form despite being distinctly professional. Chapter headings will give some idea of content: The theory of use; The meaning of conservation; Conservation in practice; Motives for conservation; The social benefits of conservation; Conservation for defence and employment; Ignorance, risk, and monopoly; A social rate of interest; Conservation and intervention; Conservation by socialization, compulsion, and "liaison;" Conservation and resource tenure; Conservation and taxation.

SOILS

Anderson, A. C., and others. SOIL SURVEY OF SKAMANIA COUNTY, WASHINGTON. US Soil Cons. Serv., Ser. 1940, no. 20. 1-92 p., illus. + large folding maps. July 1956. $1.75 from Supt. Documents.
Covers only agricultural southern part of county.

Fowlkes, Thomas, and others. SOIL SURVEY OF TUNICA COUNTY, MISSISSIPPI. US Soil Cons. Serv., Ser. 1942, no. 14. 1-86 p., 3 figs. + large folding maps. May 1956. $2.50 from Supt. Documents.

Hubbard, E. H., and others. SOIL SURVEY OF SEVIER COUNTY, TENNESSEE. US Soil Cons. Serv., Ser. 1945, no. 1. 203 p., illus. + large folding maps. Aug. 1956. $3.75 from Supt. Documents.

SOILS--Continued

Layton, M. H., and others. SOIL SURVEY OF CHERRY COUNTY, NEBRASKA. US Soil Cons. Serv., Ser. 1940, no. 21. 91 p., illus. + large folding maps. Aug. 1956. $3.25 from Supt. Documents.

Leighty, Ralph G., and others. SOIL SURVEY OF JOHNSON COUNTY, TENNESSEE. US Soil Cons. Serv., Ser. 1946, no. 2. 150 p., illus. + large folding maps. Aug. 1956. Price not stated. Order from Supt. Documents.

Pearson, C. S., and others. SOIL SURVEY OF LIVINGSTON COUNTY, NEW YORK. US Soil Cons. Serv., Ser. 1941, no. 15. 120 p., illus. + large folding maps. Aug. 1956. $3.00 from Supt. Documents.

Petro, James H., and others. SOIL SURVEY OF FAUQUIER COUNTY, VIRGINIA. US Soil Cons. Serv., Ser. 1944, no. 7. 231 p., illus. + large folding maps. Aug. 1956. $4.00 from Supt. Documents.

Tarrant, Robert F. BIBLIOGRAPHY OF PACIFIC NORTHWEST FOREST SOILS PUBLICATIONS THROUGH 1955. US For. Serv., Pac. NW. For. & Range Exp. Sta. (Portland, Ore.), Res. Note no. 130. 1-5 p. June 1956.
45 titles are listed. Annual supplement is planned.

CONSERVATION EDUCATION

Keefe, Jim. CITIZENS OF THE SOIL. Mo. Cons. Comm. 1-40 p., with numerous drawings by C. W. Schwartz. 1956.
This nicely printed, well-illustrated booklet is written at a level suitable for children of the upper elementary grades. Dad takes Celia and Phil through the museum in the State Capitol. As he discusses the exhibits with them, the youngsters soak up a lot of interesting information about Indians, pioneer life, soils, floods, and care of land. "As in earlier books [of this series], the aim is not to teach specific things so much as to instill a feeling for the interdependence of all things, upon one another and upon the soil."

Niehuis, Charley C. (Exec. Secy., Ariz. Game Protective Assn.) TRAPPING THE SILVER BEAVER. Dodd, Mead & Co., N. Y. xii + 209 p., illus. 1956. $3.00.
A work of fiction, full of action, suited to teen-age boys or adults, and with a strong conservation slant as a basic part of the plot. The locale is the lower Colorado River with its immense marshes and great canyons and rapids near the town of Needles, Calif. Webb Dodge is a 17-year old river boy who lives for hunting and trapping and for the Labrador retriever he found as a pup. The boy, living on the border of delinquency, gets in trouble with the law and is paroled to an Ariz. Game Ranger. The ranger has Webb employed as a trapper in a 2-state beaver-management program. Crooked fur buyers dangle big money before the boy's hungry eyes and make the mistake of telling him too much. Poachers, endangered by the state trapping and by Webb's observations of their activities, join forces with the buyers. Repeated attempts to kill the boy and make his death seem accidental, and to hijack the pelts, provide enough action for any reader. The picturesque aspects of hunting and trapping in the marshes and canyons afford interesting background for all outdoor-minded people. The question of the Labrador's origin and ownership is a well-handled theme of the volume.

North Dakota. WILDLIFE LESSONS. N. Dak. Game & Fish Dept. in coop. with N. Dak. Wildl. Fed. Parts separately paged. [1955?]
A set of printed and offset papers jacketed for school use in a sturdy, labeled, loose-leaf notebook. The first paper is W. L. Miller's good booklet, "Wildlife in North Dakota" (see WR 78: 15). The last is the latest annual report of the Game and Fish Dept. Between are numerous offset leaflets and pamphlets. Four of these are long, fictionalized accounts of the life of a pheasant, a blue-winged teal, a prairie chicken, and a sharp-tailed grouse. Each of these 4 closes with teaching suggestions and questions. Shorter leaflets explain such subjects as: reasons for game seasons, fish stocking, winter kill of fish, undesirability of burning game cover, policy on game stocking, the hunter-farmer problem, winter mortality of pheasants, too many

little fish, why refuges serve little useful purpose for resident game, functions and policies of the Fish & Game Dept. The set as a whole should give teachers and students a good grasp of wildlife problems and policies in the state. Papers in the set vary widely in their appeal to any one age group, but any person, whether grade-schooler or adult, should find material of interest to him in the set.

Severy, J. W., and W. L. Pengelly. (Mont. State U.) MONTANA'S VENTURE IN WILDLIFE EXTENSION. S. Dak. Cons. Digest 23(6): 6-7, 10, 14. June 1956.

For several years, Mont. State U. and Mont. State Coll. have been putting on series of lectures and demonstrations for laymen in communities around the state. This paper tells how the forums are handled and what their content is. The beneficial results of these and other conservation education programs in the state are described.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Bullard, Clifford O. LIST OF FISH AND WILDLIFE SERVICE INFORMATIONAL LEAFLETS ON WILDLIFE. US F&WS, Wildl. Leafl. 378. May 1956.

List of available Wildlife Leaflets.

Bullard, Clifford O. LIST OF FISH AND WILDLIFE SERVICE PRINTED PUBLICATIONS ON WILDLIFE. US F&WS, Wildl. Leafl. 379. May 1956.

List of available publications in following series: Refuge Leaflets, Conservation in Action, Wildlife Circulars, Wildlife Research Bulletins, Research Reports, Conservation Bulletins, Circulars, Regulatory Announcements, and Annual Reports. Prices are stated for items that must be purchased from Supt. Documents.

Frevert, Walter. WÖRTERBUCH DER JÄGEREI. Verlag Paul Parey, Spitalerstrasse 12, Hamburg 1, Germany. 99 p. 1954. 7.80 DM, clothbound.

A useful little dictionary, entirely in German, of idiomatic terms, specialized words, and vernacular names used by German hunters and game managers. Appears to be of considerable value in interpreting German literature on game.

Gabrielson, Ira N. (Wildl. Mgt. Inst., Wire Bldg., Wash. 5, D. C.) IN MEMORIAM, STANLEY G. JEWETT. Murrelet 36(3): 32-43, photo. Sept.-Dec. 1955 [May 1956].

Sketch of life and work of a veteran naturalist of the Northwest.

INTERNATIONAL ABSTRACTS OF BIOLOGICAL SCIENCES. C. C. N. Vass, editor. Published by Pergamon Press Ltd., 4 & 5 Fitzroy Square, London W. 1, or 122 E. 55th St., N. Y. 22, N. Y.

An announcement circulated by this journal includes the following: "The Council of Biological and Medical Abstracts Ltd. has decided to change the title of their journal British Abstracts of Medical Sciences to International Abstracts of Biological Sciences. This decision results from two major developments. The first is an extension of coverage to a wider range of biological research subjects published in journals throughout the world, and the second is that the International Abstracts of Biological Sciences, with the co-operation of the specialist editors selected by the Institute of Scientific Information of the Academy of Sciences of the U. S. S. R. will include, as from the January 1957 issue, translations of the important Russian papers abstracted in the Referativny Zhurnal Biologii (Soviet Biological Abstracts) and Referativny Zhurnal Biologischekoi Khimii (Soviet Abstracts of Biological Chemistry), to be published simultaneously with their appearance in Russian.

International Abstracts of Biological Sciences abstracts the world literature in the following fields: Anatomy, Animal Behaviour, Biochemistry, Biophysics, Cytology, Embryology, Endocrinology, Epidemiology, Experimental Biology, Genetics, Haematology, Histochemistry, Histology, Immunology, Microbiology, Nutrition, Odontology, Parasitology, Pathology, Pharmacology, Physical Anthropology, Physiology, Radiation Effects, Toxicology and Viruses.

International Abstracts of Biological Sciences is published...on a non profit-making basis."

Lawrence, Donald B., and Elizabeth G. Lawrence, committee on index. ECOLOGICAL MONOGRAPHS / TWENTY-YEAR INDEX / VOLUMES 1-20, 1931-1950. Duke U. Press, Durham, N. C. 1-44 p. 1956. $2.50.

A useful, diversified index. "It gives special attention to names of organisms, geographic locations, instruments and methods, illustrations, diagrams, and maps, as well as to author names and important words from the titles and texts of the articles."

McAtee, W. L. (3 Davie Circle, Chapel Hill, N. C.) IN MEMORIAM: THEODORE SHERMAN PALMER. Auk 73(3): 367-377, 1 pl. July 1956.

Interesting account of the life and works of a man who was a distinguished conservationist, a bibliographer and biographer, and a veteran of the Biological Survey.

Richter, J. H., and C. P. Daly. (Libr. Congress.) BIOLOGICAL SCIENCES SERIAL PUBLICATIONS / A WORLD LIST 1950-1954. Publ. for Libr. Congress by Biological Abstracts. vii + 269 p. 1955. $2.00 (paper) from Biol. Abs., 3815 Walnut St., Philadelphia 4, Pa.

Extremely useful list of biological serials. It is the product of cooperation between National Science Foundation, Library of Congress, and Biological Abstracts. There are some 20,000 series in the world that carry biological papers. The list of 3,500 presented here excludes those devoted to medicine, agriculture, forestry, and certain other fields of applied biology, but otherwise is inclusive although not 100% complete. The bulk of the book consists of a listing under about 60 subject headings. Each entry includes full title, name and location of publisher, year of origin, frequency of publication, and brief indication of contents. This section is followed by a valuable index to serials and organizations that is arranged both geographically and by subject. The index indicates by asterisks which series are covered by Biological Abstracts. This volume is indispensable to anyone who has to verify or complete citations and it should be useful to everyone who does much searching for source material. Certainly it should be in every biological library worthy of the name. Fortunately, the price makes it readily available to everyone.

Ross, Alexander. Edited by K. A. Spaulding. THE FUR HUNTERS OF THE FAR WEST. U. Okla. Press. 304 p., 19 illus., 1 map. 1956. $5.00. [From review by Harry Tschopik, Jr., Nat. Hist. 65(4).]

Ross was active in the great fur trade at the mouth of the Columbia R. from 1810 to 1825. "These two dates bracket the Far Western fur trade from its active beginning to its initial decline, and Ross' account of this dramatic era is one of the most complete and detailed that has come down to us." This was the period of daring exploration by the mountain men. "The chief theme of the book is the competition between British and American interests for the vast wealth in furs... The characters are a cross section of the northwest frontier--traditional-minded company managers and adventurous, adaptable mountain men, Indian trappers and warriors, and tight-fisted Scotch traders. Indian encampments, trading posts, and frontier forts are described in detail..."

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Cottam, Grant, and J. T. Curtis. (U. Wis.) THE USE OF DISTANCE MEASURES IN PHYTOSOCIOLOGICAL SAMPLING. Ecol. 37(3): 451-460, 2 figs. July 1956.

"A number of methods have been described in recent years which utilize spacing distances instead of fixed-area plots for the sampling of plant communities in compositional studies. All of these methods possess certain obvious advantages when compared to the standard plot techniques, since they all are more efficient in terms of results obtained per man-hour expended. They are faster, require less equipment and fewer workers, and are much more flexible, in that there is no need to adjust the sample size for the particular density of the vegetation type under study. The advantage in speed is particularly great, with savings of 90% or more commonly obtained. Currently, the main disadvantage of these distance methods lies in their unfamiliarity, which raises doubts as to their precision and limitations. The purpose of the present paper is to compare some of the methods, as used on three natural forests and an artificial random population, with respect to their relative

accuracy and other characteristics..." Methods compared are: closest individual, nearest neighbor, random pairs, point-centered quarter, and quadrat. "The quarter method gives the least variable results for distance determinations, provides more data on tree species per sampling point, and is least susceptible to subjective bias. The mathematical characteristics are known. It requires no correction factor, the mean of the distances equalling the square root of the mean area. The apparent disadvantage of requiring more time per point is compensated for by the necessity for sampling fewer points. ...the quarter method is, in most respects, superior to the other distance methods studied, and its use is recommended."

Various authors. FESTSCHRIFT FÜR ERWIN AICHINGER ZUM 60. GEBURTSTAG. Sonderfolge der Schriftenreihe Angewandte Pflanzensoziologie. 2 vols. xxdi + 1310 p. Springer-Verlag, Wien, Austria. 1954. DM 90. ($21.40). [From long review by R. H. Whittaker, Ecol. 37(2).]

Phytosociologists and ecologists from all over the world have contributed to this massive 2-volume work of 95 papers. There are many papers on forest ecology and phytosociology. The largest share of these represent Central Europe and the school of Braun-Blanquet but other areas and schools are represented. A few papers present, in German, the views of Russian students of forest ecology. Several papers deal with grasslands. Two essays consider concepts of climax, and others take up a variety of technical matters in plant ecology. This Festschrift, together with the one for Braun-Blanquet, should provide seriously interested scholars (who can surmount the linguistic barriers) with an excellent view of current thinking on plant ecology in other countries.

Various authors. IN HONOREM SEPTUAGENARII J. BRAUN-BLANQUET. Vegetatio, Acta Geobotanica vols. 5 & 6. xii + 606 p. Publ. by Junk, Den Haag. 1954. Dutch guilders 60. ($15.80). [From long review by Pierre Dansereau, Ecol. 37(2).]

Mapping and classification of vegetation in Europe have been greatly influenced by the Braun-Blanquet school of workers, which is termed the Zürich-Montpellier school. The Braun-Blanquet system has been modified in many ways and has been applied for various purposes. The present volume, prepared in honor of Braun-Blanquet, contains 72 contributions by 81 authors from 25 countries. "It is certainly most useful to have this volume now, as a compendium of current thinking on the part of the Zürich-Montpellier school. The many ideas which have been proffered and used by this group through the years are all represented here. Some of them are possibly now past their 'optimal phase,' and new ones are emerging."

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Anon. FOREST TREES COMMON TO SOUTHERN NEW ENGLAND AND ADJACENT AREAS IN NEW YORK STATE; A POCKET MANUAL. Conn. For. & Park Assn. (Wallingford), Publ. no. 45. 62 p., illus. 1955. 75¢. [From J. For. 54(9).]

Batson, Wade T. (U. of S. C.) EVERGREEN AND SEMI-EVERGREEN PLANTS NATIVE TO SOUTH CAROLINA. U. of S. C. Publ., Ser. 3, Biol., 1(2): 89-109. June 1953.

"...a list of most of the evergreen and tardily deciduous ferns and flowering plants native to South Carolina. Both the scientific and common name is included as well as the natural habitat and range, and in some instances general information on the species, is also included."

Batson, Wade T., and Wm. R. Kelley. (U. of S. C.) AN ECOLOGICAL STUDY OF THE LAND PLANTS AND COLD-BLOODED VERTEBRATES OF THE SAVANNAH RIVER PROJECT AREA. Part I. THE FLORA OF THE SAVANNAH RIVER PROJECT AREA. 1. THE MONOCOTYLEDONS. U. of S. C. Publ., Ser. 3, Biol., 1(2): 60-89. June 1953.

List with scientific and common names, habitat, and months of flowering. A preceding paper by W. E. Hoy provides background on the whole study.

Bowers, N. A. CONE-BEARING TREES OF THE PACIFIC COAST. 5th printing. Pacific Books, Palo Alto, Calif. 169 p., illus. 1956. $3.50. [From J. For. 54(9).]

Cobb, Boughton. A FIELD GUIDE TO THE FERNS / AND THEIR RELATED FAMILIES OF NORTHEASTERN AND CENTRAL NORTH AMERICA WITH A SECTION ON SPECIES ALSO FOUND IN THE BRITISH ISLES AND WESTERN EUROPE. Houghton Mifflin, Boston. xx + 281 p., illus. 1956. $3.75.

Fine, semitechnical guide to ferns, horsetails, clubmosses, spikemosses, and quillworts of ne. U. S. and s. Canada from Maine and Wis. s. to Va. and Ky. It is the newest and one of the best of the Peterson Field Guide Series. Owing to the relatively few species to be covered (about 100), Cobb has been able to supply more background and detail than are in most of the series. The result is more nearly a handbook than a mere guide. The book begins with a series of simple, illustrated "keys" that should facilitate rapid, tentative identification if used with a little care. The keys refer one to the species accounts. Each species is illustrated by a full-page drawing from life. Drawings are good, but a bit delicate, detailed, and shaded for some tastes. They show the whole plant, including roots, and include detailed drawings of fruiting structures. Arrows indicate key points. Text for the species is on the facing page and is conveniently broken down by the bold-face headings Style, Ecology (habitat and range), Leaves, Leaflets, Axis, Stalk, Rootstock, Roots, and Fruitdots. Other text sections explain the parts of the plants treated and give good, brief accounts of life cycle, families, and genera. Cobb does not omit technicalities; he explains them simply. He does not gloss over complexities; he warns against them at suitable places. These are vital criteria of a manual. Appended to the book are a set of notes on Am. ferns in Britain and W. Europe; instructions for growing ferns, by H. L. Foster; a short account of ferns and their allies in the past, by Theodor Just; a list of selected references, including state fern floras; and a good index.

Greene, H. C., and J. T. Curtis. (U. Wis.) A BIBLIOGRAPHY OF WISCONSIN VEGETATION. Milwaukee Pub. Mus., Publs. in Bot. no. 1. 84 p. 1955. $1.50.

About 950 titles are listed under 15 subjects: Physical Features of Wisconsin, Biographies, State-wide Floras, Taxonomic Studies of Vascular Plants, State-wide Vegetation Studies, etc.--Neil Hotchkiss.

Gunn, Charles R. (Ross Seed Co., Louisville, Ky.) A GUIDE TO SOME RECENT STATE FLORAS. Castanea 21(1): 33-38. Mar. 1956.

Describes recently published floras of 18 states. The more detailed are for Ariz., Colo., Del., Idaho, Ill., Mont., N. Dak., Ore., and W. Va. [For earlier but more extensive list of floras see Blake and Atwood, 1942, USDA Misc. Publ. 401.]--Neil Hotchkiss.

Hale, Mason E., Jr., and William L. Culberson. (W. Va. U.) A CHECKLIST OF THE LICHENS OF THE UNITED STATES, CANADA, AND ALASKA. Castanea 21(2): 73-105. June 1956.

Kelley, Wm. R., and Wade T. Batson. (U. of S. C.) AN ECOLOGICAL STUDY OF THE LAND PLANTS AND COLD-BLOODED VERTEBRATES OF THE SAVANNAH RIVER PROJECT AREA. Part I. THE FLORA OF THE SAVANNAH RIVER PROJECT AREA. 2. THE DICOTYLEDONS (SAURURACEAE THROUGH THE PLATANACEAE). U. of S. C. Publ., Ser. 3, Biol., 1(4): 189-206. Jan. 1955.

List with common and scientific names, habitat, and months of blooming.

Kelley, Wm. R., and Wade T. Batson. (U. of S. C.) AN ECOLOGICAL STUDY OF THE FAUNA AND FLORA OF THE SAVANNAH RIVER PROJECT AREA. Part I. THE FLORA OF THE SAVANNAH RIVER PROJECT AREA. 2. THE DICOTYLEDONS (ROSACEAE, MIMOSACEAE, CAESALPINIACEAE AND FABACEAE). U. of S. C. Publ., Ser. 3, Biol., 1(5): 259-266. June 1955.

List with common and scientific names, habitat, and months of blooming.

Kelley, Wm. R., and Wade T. Batson. (U. of S. C.) AN ECOLOGICAL STUDY OF THE FAUNA AND FLORA OF THE SAVANNAH RIVER PROJECT AREA. Part I. THE FLORA OF THE SAVANNAH RIVER PROJECT AREA. 2. THE DICOTYLEDONS (OXALIDACEAE THROUGH LOGANIACEAE). U. of S. C. Publ., Ser. 3, Biol., 2(1): 3-21. Mar. 1956.

List with common and scientific names, habitat, and months of blooming.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

Mobberley, David George. (Simpson Coll.) TAXONOMY AND DISTRIBUTION OF THE GENUS SPARTINA. Iowa State Coll. J. Sci. 30(4): 471-574, 26 figs., 5 pl. May 1956.
Detailed, quantitative revision of a group of grasses of considerable wildlife importance.

Moss, E. H. (U. Alberta.) THE VEGETATION OF ALBERTA. Bot. Rev. 21(9): 493-567, illus. Nov. 1955.
Includes discussions of the flora, phytogeographic problems, prairie, parkland, poplar forest, boreal forest, cordilleran forest, alpine vegetation, marsh and reed swamp, miscellaneous types of vegetation, and applied ecology.--Neil Hotchkiss.

Ritchie, J. C. (U. Manitoba.) THE NATIVE PLANTS OF CHURCHILL, MANITOBA, CANADA. Can. J. Bot. 34(2): 269-320, illus. Mar. 1956.
Includes accounts of geology, climate, vegetation, and an annotated catalog.--Neil Hotchkiss.

PLANTS--FOREST SURVEYS

Anon. FORESTS OF EAST TEXAS, 1953-55. US For. Serv., S. For. Exp. Sta. (New Orleans, La.), For. Surv. Rel. 77. ii + 51 p., 12 figs. June 1956.
Forest types, volume, growth, cut, forest industries, opportunities for improving forest productivity, and numerous tables. Comparisons are made with conditions in 1935.

Cunningham, R. N., and others. LAKE STATES TIMBER RESOURCES. US For. Serv., Lake States For. Exp. Sta. (St. Paul 1, Minn.), Sta. Pap. no. 37. v + 31 p. July 1956.
Tabular data for Mich., Wis., and Minn. No discussion or conclusions.

Ferguson, Roland H., and Milford C. Howard. THE TIMBER RESOURCE IN MASSACHUSETTS. US For. Serv., NE. For. Exp. Sta. (Upper Darby, Pa.) [No series designation.] v + 45 p., 4 figs. + folding map of forest types. 1956.
"This report shows, for the year 1953, the area and condition of the forest land, the volume and quality of standing timber, the rates of timber growth and mortality, and the extent of timber cutting for forest products." Nearly 2/3 of the land area of Mass. is still in forest. Growth greatly exceeds drain, but the surplus is largely in relatively low-grade hardwoods. The growing of a larger volume of high-quality timber offers a real economic opportunity to the state.

Hutchison, O. Keith, and James T. Morgan. OHIO'S FORESTS AND WOOD-USING INDUSTRIES. US For. Serv., Central States For. Exp. Sta. (Columbus, Ohio), For. Surv. Rel. no. 19. 1-40 p., 26 figs. May 1956.
Ownership, timber types, volume, growth, cutting, trends, timber use and harvest, tables of data, etc.

McCormack, James F. FOREST STATISTICS FOR THE PIEDMONT OF NORTH CAROLINA, 1956. US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), For. Surv. Rel. no. 48. ii + 44 p., 6 figs. July 1956.

Warner, John R., and Clarence D. Chase. THE TIMBER RESOURCE OF NORTH DAKOTA. US For. Serv., Lake States For. Exp. Sta. (St. Paul 1, Minn.), Sta. Pap. no. 36. iii + 39 p., 13 photos, 4 graphs. Feb. 1956.
A popular, well-illustrated report that covers the nature of the state and its forest types and gives data on area, ownership, volume, growth, drain, etc. of woodlands. Most of the text is in narrative style; numerical data are presented in graphs and tables.

WILDLIFE--NEW GAME SERIES

NEW MEXICO WILDLIFE. Published monthly by N. M. Dept. Game & Fish, Santa Fe. Vol. 1, no. 4, 8 p., Apr. 1956. $1.00 for 2 years.

This new state fish and game journal has begun as a newspaper of 15.5 x 11.5 in. with 5 columns per page. It is to be one of the main publication outlets of the department. It carries some technical articles, news of departmental and other wildlife activities in the state, and miscellaneous notes of conservation interest. The conservation section in New Mexico Magazine was discontinued with the June 1956 issue.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Curry-Lindahl, Kai. DJUREN I FÄRG (Animals in Color). Almqvist & Wiksell, Stockholm. 172 p., illus. 1955. 8.75 kr. (about $1.70.).

A fine pocket guide to Swedish mammals, reptiles, and amphibians. Colored drawings on p. 9-72 portray each species. The remainder of the book gives accounts of each species. The text contains not only descriptions but also much interesting information on ecology, distribution, litter size, gestation period, food habits, and age attained in the wild. The color illustrations are roughly comparable with those of Zim's Golden Nature Guides but the text material is greater and more informative in Curry-Lindahl's book. This book should be of value, especially to Americans who read Swedish, as a handy, low-priced reference on the mammalogy and herpetology of North Europe.--V. F. Flyger.

Denyes, H. Arliss. (Fla. State U., Tallahassee.) NATURAL TERRESTRIAL COMMUNITIES OF BREWSTER COUNTY, TEXAS, WITH SPECIAL REFERENCE TO THE DISTRIBUTION OF THE MAMMALS. Am. Midl. Nat. 55(2): 289-320, 3 figs. Apr. 1956.

Summary: "That part of Brewster County which possesses true basin and range physiography is included in the Chihuahuan biotic province. It is further subdivided, on the basis of local differences in climate, soils, and ecologic associations, into two biotic districts. In the Chisos biotic district, three life belts and nineteen ecological associations are described. In the Davis Mountain biotic district, two life belts and fifteen ecologic associations occur. The plant communities of Brewster County are largely edaphically controlled. Altitude, nature of the surface, and degree of slope also modify the distribution of the plant communities. Much of the Chihuahuan biotic province is transitional in character. There are many radical changes in exposure, slope, drainage, soil, and altitude which cause great variations in the vegetational patterns. The tendency to designate each different area, such as separate mountains, as distinct biotic districts should be avoided in order not to minimize the essential unity of the central part of the Chihuahuan biotic province."

Scherman, Katherine. SPRING ON AN ARCTIC ISLAND. Little, Brown & Co., Boston & Toronto. xvii + 331 p., 16 photos. 1956. $5.00.

Katherine Rosin and her husband Axel, experienced travelers, led an expedition to mountainous Bylot Is., n. of Baffin Is. in the E. Can. Arctic. Scientists were J. Van Tyne of Mich. and Wm. Drury, Mrs. Drury, Richard Miller, Benjamin Ferris, and Ed. Ames of Harvard. Their guide was Idlouk, shrewdest and most efficient Eskimo leader of the region. They studied birds, mammals, insects, plants, ecology, frost action, and health. The Arctic in spring is hard and treacherous even for natives. Travels on melting, drifting sea-ice wrecked sleds and endangered lives. Some hunts for seals and sea birds were almost nightmares. Hardships were the rule. But the Rosins left feeling they were leaving the happiest and most peaceful world they had ever known. Mrs. Rosin tells of the trip honestly and artistically. She presents technical findings in simple, narrative form. You gain a surprisingly good idea of Eskimo life and character and of changes occurring under influence of traders, police, and missionaries. Lives and attitudes of these white men are conveyed interestingly and sympathetically. Eskimo legends--wierd and earthy--are worked into the narrative. Tundra, mud, rocks, ice, plants, and animals of Bylot become real to the reader and change with the season. The book is easy reading, not a scientific report. For a book of this sort it seems to give an exceptionally good, interesting picture of human life and wildlife today in a changing yet little-disturbed portion of the Arctic.

Venables, L. S. V., and U. M. Venables. BIRDS AND MAMMALS OF SHETLAND. Oliver & Boyd, Edinburgh, Scotland. 391 p., 3 maps, 8 photographic plates. 1955. 30s. [From review by K. W., Brit. Birds 49(5).]

"...perhaps the most stimulating regional study of recent years." The authors "must have realised at an early stage that their birds called for more specialized treatment than is customary in county faunistic surveys: increase and decrease, abundance and scarcity, colonization and extinction all need to be related to the special qualities of the climate and landscape, and song-periods and breeding activities to the comparative lateness of the season in these higher latitudes. The authors have succeeded well in applying considerations of biology and ecology to their field-observations, and the essays on the more important species...are models of this type of approach... In addition to the systematic accounts of birds and mammals...there are chapters concerning Shetland habitats, Shetland naturalists past and present, and status changes during the past 80 years. These are ably summarized... Not only is the book full of interesting facts, lucidly interpreted and discussed, but it is most attractively produced, with excellent photographs of Shetland habitats, useful breeding-lists of birds and mammals for the separate islands, a calendar of average flowering-dates of Shetland plants, and a good working index."

WILDLIFE--NATURAL AREAS & REFUGES

Anon. $80,000 FOR CONSERVATION. Nature Conservancy (4200 22nd St. NE., Wash. 18, D. C.), Inf. Bul. 18. 1-6 p., mimeo. Apr. 1956.

Detailed account of painstaking efforts by which funds were raised and land and equipment were acquired for the Wis. Audubon Camp. It is published as a guide for those undertaking similar campaigns.

Anon. THE NATURAL AREA SITUATION, 1955-56. Nature Conservancy (4200 22nd St. NE., Wash. 18, D. C.), Inf. Bul. 22. 1-20 p., mimeo. July 1956.

A review of progress and changes in preserving natural areas in each state. There are also a summary of reports on preserving seashore tracts, a note on the existence of the federal wetlands inventory, and an estimate of the percentage of "empty" lands in each ne. state.

Branch of Wildlife Refuges. PUBLIC USE OF NATIONAL WILDLIFE REFUGES - 1955. US F&WS, Wildl. Leafl. 375. 1-4 p. Apr. 1956.

Listed for each refuge are total number of visitor days and number of visitor days for hunting, fishing, and miscellaneous purposes. For refuges as a whole, there were 6,974,447 visitor days. Of these days, about a third, 2,677,452, were for fishing, 406,219 were for hunting, and 3,890,776 were for such purposes as picnicking, swimming, nature study, and business.

Marshall, Robert. ARCTIC WILDERNESS. Edited, with an introduction, by George Marshall. Foreword by A. Starker Leopold. U. Calif. Press. xxvi + 171 p., 30 photos, 6 maps. 1956. $3.75.

In his 39 action-packed years, Bob Marshall evolved from a city boy into a highly trained research forester, explorer, mapper, writer, federal administrator, and a leader in the wilderness movement. The high points of his life were his explorations of the Northern Koyukuk River region in and just south of the Brooks Range in Alaska. He returned again and again to this vast area of fantastic scenery and unmapped wilderness. Parts of his journals have been published before, but in this book all his accounts of his Koyukuk trips are brought together and a brief biography by his brother and editor is added. The style of writing is light but vivid and the book makes easy, inviting reading. You learn how the author and his companions lived and traveled in the rugged, rainy, unknown, arctic land. You share his enthusiasm as he climbs peaks unnamed before his work and discovers gorge after gorge that would rate national park classification in the U. S. You also enjoy his comments on the white woodsmen, Eskimos, and Indians whom he met and with whom he traveled. In all, you have the pleasure of a good adventure story and you admire the zest and ability of the man who lived and wrote it.

National Park Service. OUR VANISHING SHORELINE. US Nat. Park Serv. 36 p., illus. No date. 1956.

A beautifully prepared, persuasive booklet in which text and a multitude of fine photographs are integrated to tell of our rapid loss of seashore areas. Of the 3,700 miles of shoreline along the Atlantic and Gulf coasts, only 6.5%, or 240 miles, are now in public ownership. There are 126 undeveloped areas, of which 54 are of interest as public seashores. These 54 contain 640 miles, or 17% of the Atlantic-Gulf coastline. All but 6 of these 54 are of high or moderate value to waterfowl. All have great recreational potential and perhaps 5 also have historical importance. Locations of the tracts are stated and some of the tracts are described and illustrated. At least half of these tracts should be acquired for public recreation; this would bring the total in public ownership to 15%. Prompt action by all interested groups and individuals is necessary, for development is rushing ahead and prices are skyrocketing. Acquisition should be related as directly as possible to distribution of human population, except where biological or other values are paramount. Ample quantities of hinterland of marsh and swamp, which provide valuable habitats for a great variety of bird and animal life, should be acquired in connection with beach property. Where such areas can provide a fresh-water habitat, the variety will be greatly enhanced. Biological communities of high ecological interest should be acquired regardless of the desirability of the adjoining beachland. Consideration should be given to such communities even if they are in a modified condition, for they may return to natural condition if left undisturbed.

Various authors. WYOMING'S NATIONAL FOREST WILDERNESS. Living Wilderness 20(54): 3-12, 1 photo, 9 maps. Autumn 1955.

Maps and describes each of the 8 Natl. For. Wilderness Areas in Wyo. These areas total 2,300,000 acres. The articles include information on access and sources of further information.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Lehrman, D. S. COMPARATIVE PHYSIOLOGY (BEHAVIOR). (Rutgers U., Newark, N. J.) Ann. Rev. Physiol. 18: 527-542. 1956.

A condensed review paper discussing (1) neurology and hormonal influences in relation to instinctive behavior, including an analysis of the bearing of neurological studies on Lorenz's theories, (2) bird navigation and orientation, (3) taxonomic and comparative studies of behavior. Numerous references are cited.--L. F. Stickel.

Scott, J. P. (Jackson Lab., Bar Harbor, Me.) THE ANALYSIS OF SOCIAL ORGANIZATION IN ANIMALS. Ecol. 37(2): 213-221. Apr. 1956.

"An attempt has been made in this article to present a systematic general outline for the analysis of social organization in animals."

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Anon. WILD GEESE KNOCKED OUT IN POISON SPRAY AREA. Okla. Game & Fish News 12(5): 20. May 1956.

"Fifty wild snow and blue geese apparently were killed by parathion poison spray being used to kill insects on wheat and alfalfa fields along the Arkansas River near Porter [Okla.], the last week of March this year. Another 100 geese were found suffering varying degrees of sickness apparently caused by the poison... All the geese showed the same symptoms, foaming at the mouth and bleeding at the vent. ...parathion poison spray has been in use in Oklahoma since 1949. There have been no previous reports of geese killed by the poison."

MacLennan, J. M. (Can. Wildl. Serv.) POLLUTION AND WILDLIFE. Can. Dept. N. Affairs & Natl. Resources, Wildl. Mgt. Pap. Delivered at 18th Fed.-Prov. Wildl. Conf. p. 39-43. 1954.

Review of pollution problems across Canada and what is being done about them. Oil pollution from ships is still serious along the e. coast. One wreck caused death of at least 1,500 ducks that were salvaged and eaten by people. Industrial, oil, and sewage pollution are reported from various parts of Canada. These affect fish and to a lesser extent waterfowl. Federal, provincial, and municipal agencies are making gradual progress in controlling pollution, and they are aided by protests of sportsmen.

Przygodda, Wilfried. EXPERIMENTS ON THE INFLUENCE OF E 605 FORTE ON OUR AVIFAUNA. Die Vogelwelt 75(1): 1-18. 1954. [From long abstract by Frances Hamerstrom, Bird-Banding 27(3).]

In German. This chemical [fortified parathion] is used for control of San Jose scale in apple orchards. Both laboratory tests and field observations show that it can kill many kinds of birds. In a 4 ha. orchard sprayed with double strength E 605 forte on 3 successive days, 35 dead and 21 seriously ill birds were reported. See Mrs. Hamerstrom's abstract for further data on tests.

Przygodda, Wilfried. PLANT PROTECTIVE MATERIALS IN RELATION TO BIRDS WITH REFERENCE TO OTHER ANIMALS. Biol. Abhandlungen 12. 34 p. 1955. [From abstract by D. S. Farner, Bird-Banding 27(3).]

In German. "This is an extensive review of the effects of fungicides, herbicides, and insecticides on birds. In general the arsenicals applied by dusting are dangerous to birds and other animals; application by spraying is considerably less dangerous. DDT in heavy applications may be dangerous to nestlings. Hexachlorcyclohexane as used in June beetle control may be dangerous also when applied heavily. Poisoning in birds by the phosphoester insecticides occurs primarily in excessively heavy application. There is little evidence that systemic insecticides are dangerous to birds as used. Among the herbicides DNC may be dangerous whereas there is little danger from 2,4-D. With respect to insecticides, emulsions are more dangerous than suspensions." Bibliography of 128 titles.

Springer, Paul F. (Patuxent Refuge, Laurel, Md.) INSECTICIDES--BOON OR BANE? Aud. Mag. 58(3): 128-130, 1 photo, May-June 1956; 58(4): 176-178, 2 photos, July-Aug. 1956. Reprints of whole article, 10¢ from Natl. Aud. Soc., 1130 5th Ave., N. Y. 28, N. Y.

This review article discusses the effects of many of the newer insecticides (newer than DDT) on birds, mammals, and aquatic life. Data are based on research studies and most of them are stated quantitatively. Numbers of the newly-developed chemicals are greatly more toxic than DDT and should be applied with high degrees of caution if mass deaths or curtailed reproduction of wildlife are to be avoided. Precautions are outlined.

WILDLIFE--PARASITES & DISEASES

Baker, E. W., T. M. Evans, D. J. Gould, W. B. Hull, and H. L. Keegan. A MANUAL OF PARASITIC MITES OF MEDICAL OR ECONOMIC IMPORTANCE. Natl. Pest Control Assn., 30 Church St., N. Y. v + 170 p., 59 figs. 1956. $4.25.

Appeals to reviewer as an exceptionally fine, useful handbook. It was prepared by experts from federal agencies. To quote from introduction, "This manual summarizes current knowledge pertaining to the biology, taxonomy, and control of the parasitic mites of medical and economic importance. The species discussed are either of direct medical and veterinary importance or are frequently encountered because they are parasitic on animals in which man is interested. In the latter category are mites parasitic or predaceous on bees, mosquitoes, grasshoppers, roaches, moths and earthworms... Special attention has been given to references dealing with biology and control." The book begins by telling how to mount mites and recognize their structures. A key to included species follows. The rest of the volume consists of treatments of species or groups, with information on description, distribution, life history, disease transmission, control, and selected references. The 59 figures are drawings of mites. Many important mites have cosmopolitan distribution and

this book is, to a large extent, on a world basis. Mites of various mammals, birds, and reptiles are given full attention. Control methods that are recommended appear to be essentially up-to-date. Recommendations take cognizance of effects of chemicals on host animals. Users of the book should find it a gold mine of useful information and references.

Herman, Carlton M. (Patuxent Refuge, Laurel, Md.) RECENT DEVELOPMENTS IN WILDLIFE DISEASE STUDIES IN THE NORTHEAST. Proc. NE. Sections Wildl. Soc. et al., 1956. 1-9 p., mimeo. May 1956.
Provides brief reviews of work done in the NE. on various diseases or pathological conditions of game animals.

Honess, Ralph F., and Kenneth B. Winter. (Wyo. Game Comm.) DISEASES OF WILDLIFE IN WYOMING. Wyo. Game & Fish Comm. Bul. 9. 1-279 p., 148 figs. 1956.
A detailed, technical reference for students of wildlife diseases. It is also the closest thing to a manual of wildlife diseases that has yet appeared. Owing to its rather encyclopedic nature, it should be valuable as a handy general reference in its field. It is, as the title implies, based on diseases and parasites that are found in Wyo. It naturally emphasizes those conditions and parasites that the authors have studied most. Thus protozoan and helminth parasites receive much more attention than bacterial and viral diseases. The text is organized around groups and species of pathogens. There are sections on bacterial, fungal, and viral diseases; non-infectious diseases such as botulism and muscular dystrophy; organisms of uncertain classification; protozoans; flatworms; round worms; and ectoparasites. Much information on identification is given by descriptions, numerous illustrations, and technical keys that are scattered through the book. A typical account of a disease has statements or paragraphs on such topics as etiology, pathogenicity, source of infection, symptoms, control, other animals affected, and Wyo. records. 318 references are cited and an index is provided.

Stefferud, Alfred, editor. ANIMAL DISEASES. USDA, Yearbook of Agr. 1956. xiv + 591 p., illus. 1956. $2.00 from Supt. Documents.
"This Yearbook gives information about the cause, nature, and prevention of the common diseases of animals on American farms." It consists of many short papers (most of them not documented) on such topics as causes of disease, genetics and disease, antibiotics, disinfection, poisonous plants, toxicity of insecticides, flies that affect livestock, rabies, leptospirosis, listeriosis, cattle scabies, hog cholera, lungworms in sheep and goats, scrapie in sheep, hexamitiasis of turkeys, fowl typhoid, diseases of domestic ducks, parasites and diseases of dogs and cats, and equine encephalomyelitis. There are also chapters on diseases and parasites of captive rabbits, minks, and foxes. No chapter pertains primarily to wild animals, but wildlife biologists will find the book a handy general reference to parasites and diseases that affect both wild and domestic animals, or which are carried by wild animals. The volume is well indexed.

SYMPOSIUM ON ECOLOGY OF DISEASE TRANSMISSION IN NATIVE ANIMALS. Sponsored by Ecol. Research, U. of Utah, for Army Chem. Corps. Held at Dugway Proving Ground, Dugway, Utah, 6-8 April 1955. v + 112 p., illus. Received Aug. 1956.
A series of short technical papers on mammalian populations, ectoparasites of birds and mammals, disease transmission, and related subjects that have been studied in connection with biological warfare assessment work at Dugway. Titles and authors are: Ecological sample areas as standards for biotic communities, by Seville Flowers. Biotic communities as epizootic highways, by Dean Vest. An exploratory study of quantitative methods of trapping rodents, by Dean Vest. An annual cycle in the desert black-tailed jackrabbit, by A. M. Woodbury. Studies of the population dynamics of certain rodents of the Great Salt Lake Desert, by M. E. Rosasco. Aquatic problems in the desert, by Arden Gaufin. Mammal distribution in relation to disease, by E. A. Shippee. Bird movements and disease transmission, by J. B. Bushman. Sampling vertebrates for disease, by D. D. Parker and John Smith. The faunal colony as a reservoir of native animals, by H. J. Egoscue. Rearing the pallid Ord kangaroo rat in the laboratory, by W. P. Jollie. The ectoparasite rearing program, by H. E. Cott, D. M. Allred, and E. J. Roscoe. Ectoparasites of birds and mammals, by E. B. Davidoff. Ticks and mites as potential vectors, by D. M. Allred. Ecological observations on the insect fauna of the Great Salt Lake Desert and their

epizootic implications, by H. E. Cott. Intestinal protozoa of rodents of the Great Salt Lake Desert, by Frederick Evans. Endoparasites as vectors of disease, by Albert Grundman. Ecological studies of tularemia in Utah, by A. M. Woodbury. Experimental infections, by Gordon Stagg. Standardization of blood protein fractions in rodents, by N. J. Marchette. Laboratory support of epizootiologic and epidemiologic studies conducted in the Great Salt Lake Desert, Utah, by H. G. Stoenner and Donald Waldhalm. Reports of discussions are included.

WILDLIFE--POPULATIONS & FLUCTUATIONS

Various authors. LECTURES ON POPULATION DYNAMICS. Scripps Inst. Oceanography, La Jolla, Calif. 66 p., mimeo. Oct. 1955.

"On September 6, 7 and 8, 1955, a series of lectures on population dynamics was given at Scripps Institution of Oceanography. The main points discussed by the speakers are presented in this brochure." The brochure contains the following papers: 1. Graphic analysis of growth data, with a use for mathematical models. 2. Formulations for various methods of hunting and escape in the prey-predator interaction. 3. A re-study of the Lindeman approach to community dynamics. 4. Evaluating tolerance limits for estimates of density by sampling. 5. Some consequences of the theory of random encounters in determining the density of and yield from animal population. 6. Application of population dynamics to commercial fisheries. 7. Discussion of population problems related to salmon stocks. 8. The possibilities of obtaining complete cross-feeding in a materially closed system with a mixed population of known microorganisms.--Vincent Schultz.

Wing, Leonard W. (3875 Vorhies Rd., Ann Arbor, Mich.) ULTRA-LONG WAVES AND GLOBAL PATTERNS OF TEMPERATURE. J. Cycle Res. 5(2): 31-59, 11 figs. Apr. 1956.

Technical study of certain world-wide temperature cycles. Methods and results can be understood and appraised only by specialists.

WILDLIFE--BIOMETRICS

Carlander, K. D., editor. SYMPOSIUM ON SAMPLING PROBLEMS IN CREEL CENSUS. Iowa Coop. Fisheries Res. Unit, Iowa State Coll. 80 p. Mar. 1956.

An excellent contribution on creel census problems. Should be consulted by all persons engaged in collecting creel census or hunter-bag-check data.--V. Schultz.

Chapman, D. G., and C. O. Junge, Jr. (U. of Wash.) THE ESTIMATION OF THE SIZE OF A STRATIFIED ANIMAL POPULATION. Ann. Math. Stat. 27(2): 375-389. June 1956.

Authors' summary: "The estimation of the size of an animal population is considered for a situation where the population is stratified and only partial mixing takes place between strata. A consistent estimate is found and its variance determined. It is shown that estimates previously given or frequently used in this situation are not necessarily consistent and, in fact, may be meaningless. Conditions for their consistency are determined. Some further statistical problems in estimating the interstrata migration are discussed."--Vincent Schultz.

Davis, David E. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) COLLECTION AND USE OF DATA FOR POPULATION ANALYSIS. Proc. NE. Sections Wildl. Soc. et al., 1956. 1-9 p., mimeo. May 1956.

A general discussion of ways of determining yield and suitable harvest levels of game. Data from Stott's black duck nesting study and some deer data from Severinghaus are used to illustrate certain aspects, but actual methods of calculation are not described. The value of the paper is in ideas it provides for using data to obtain desired information of practical management significance.

El-Badry, M. A. (Cairo U.) SAMPLING PROCEDURE FOR MAILED QUESTIONNAIRES. J. Am. Stat. Assn. 51(274): 209-227. June 1956.

"One aim of this work is to draw a plan that utilizes the information available to the investigator to achieve maximum efficiency; i.e., to secure an estimate which is as free as possible from the bias of non-response and which has maximum precision for the available cost or the least cost for attaining a required precision."--V. Schultz.

Lewontin, R. C., and T. Prout. (N. C. State Coll.) ESTIMATION OF THE NUMBER OF DIFFERENT CLASSES IN A POPULATION. Biometrics 12(2): 211-223. June 1956.

Deals with the case where the classes are uniformly distributed.--V. Schultz.

Mainland, D., L. Herrera and M. I. Sutcliffe. TABLES FOR USE WITH BINOMIAL SAMPLES. Dept. Med. Stat., N. Y. Univ. Coll. Med., 550 First Ave., N. Y. 16, N. Y. xix + 83 p. 1956. $2.00.

Whether evaluating their own data or that presented by others, wildlife research workers and wildlife managers will find these tables a great asset. Percentages can be tested for statistical significance, confidence limits obtained, and sample sizes estimated, merely by consulting the appropriate tables. Sample sizes utilized in the tables appear to be adequate for most work in our field. The tables are preceded by 19 p. of directions and explanations of the results. The authors state, "The main value of such tables is twofold: (1) They reduce greatly the arithmetic which investigators often find irksome. (2) They remove the risk of gross errors that often arise, especially with small samples, from approximate methods commonly used, such as the chi-square test and the standard error of the binomial."--V. Schultz.

Rider, P. R., H. L. Harter and Mary D. Lum. AN ELEMENTARY APPROACH TO THE ANALYSIS OF VARIANCE. WADC Tech. Rep. 56-20, Aeronaut. Res. Lab., Wright-Patterson Air Force Base, Ohio. iv + 65 p. Feb. 1956. "Qualified requesters may obtain copies of this report from the ASTIA Document Service Center, Knott Building, Dayton 2, Ohio."

"An introduction to the analysis of variance is given. Several important experimental designs to which this statistical technique is applicable are discussed, as are multiple comparison tests which can be used after the analysis of variance has been made. Transformations employed prior to analysis are also treated. An extensive bibliography is to be found at the end of the report."--V. Schultz.

Skellam, J. G. (Nature Conservancy, London.) THE MATHEMATICAL APPROACH TO POPULATION DYNAMICS. p. 31-46. In The Numbers of Man and Animals, J. B. Cragg and N. W. Pirie, eds. 152 p. Oliver & Boyd, Edinburgh. 1955.

Discusses exponential growth, sigmoid growth, diffusion, and diffusion and growth, including the relatively new stochastic model. A relatively easily understood summary of these topics to persons possessing a knowledge of calculus.--V. Schultz.

Skellam, J. G. (Nature Conservancy, London.) QUADRAT SAMPLING FROM THE MATHEMATICAL STANDPOINT. Proc. Linn. Soc. London. Session 165, pt. 2: 95-102. June 1955.

On a level that should be understandable to those who have had one or more courses in statistics. Discusses the calculation of "frequency" on the basis of various sample sizes from selected distributions.--V. Schultz.

Southwick, Charles H. (Ohio U., Athens.) THE LOGISTIC THEORY OF POPULATION GROWTH, PAST AND PRESENT ATTITUDES. Turtox News 34(7): 131-132. July 1956.

Evidence and published opinions are cited to show that the logistic curve should never be assumed to fit population data. Many populations do not grow in accordance with it, although some do. The investigator should ascertain if this curve does fit his data. He should not assume that the curve fits and attempt to predict from it.

Whittle, P. (Applied Math. Lab., D.S.I.R., Wellington, N. Z.) THE ESTIMATION OF AGE-SPECIFIC INFECTION RATES FROM A CURVE OF RELATIVE INFECTION. Biometrics 12(2): 154-162. June 1956.

Method applied to data on the incidence of liver lesions caused by coccidiosis in the New Zealand wild rabbit.--V. Schultz.

Zippin, Calvin. (Cancer Res. Inst., Sch. Med., U. Calif., San Francisco.) AN EVALUATION OF THE REMOVAL METHOD OF ESTIMATING ANIMAL POPULATIONS. Biometrics 12(2): 163-189, 6 figs. June 1956.

The paper covers the following topics: "1. Development of a rapid graphical procedure for obtaining maximum likelihood estimates of population size from removal method data. 2. Determination of the asymptotic precision of the removal method. 3. Report on the results of experimental sampling which was conducted in order to compare the maximum likelihood estimates with estimates by an alternative regression method (Hayne, 1949) and to study the performance of the removal method on small populations. 4. Determination of the proportion of the total population which must be trapped in order to reduce the coefficient of variation of estimates of population size to specified levels. 5. Tests of the assumptions underlying the removal method and their application to actual trapping data."--V. Schultz.

WILDLIFE--TECHNIQUES

Betts, Monica M. (Ed. Gray Inst., U. Oxford, Eng.) FURTHER EXPERIMENTS WITH AN ARTIFICIAL NESTLING GAPE. Brit. Birds 49(6): 213-215 + 2 plates. June 1956.

"A description is given of a new method of using an artificial nestling gape to collect samples of food from the parent bird, as it perches outside the nest-box." Results with several species of small birds are discussed.

Blank, T. H., and J. S. Ash. (I.C.I. Game Res. Sta., Fordingbridge, Hants., Eng.) MARKER FOR GAME BIRDS. J. Wildl. Mgt. 20(3): 328-330, 1 fig. July 1956.

A method of marking that ensures individual recognition for at least 12 mos. is described, with details of construction and application. The marker consists of a numbered plastic tag that lies flat on the bird's back and is held in position by a soft leather harness. Marked birds are identifiable at ranges over 100 yards. Partridges (Perdix perdix), red-legged partridges (Alectoris rufa), and pheasants (Phasianus colchicus) have been satisfactorily marked.--T. H. Blank and J. S. Ash.

Craighead, John J., and Dwight S. Stockstad. (Mont. State U.) A COLORED NECKBAND FOR MARKING BIRDS. J. Wildl. Mgt. 20(3): 331-332, 1 photo. July 1956.

A new type of plastic neckband has been tried on wild Canada geese with gratifying results. The material is plasticized polyvinyl chloride tape 1/2 in. wide and 0.062 in. thick. This material is strong, durable, dimensionally stable, and does not fade or accumulate ice readily. It can be obtained in 26 colors, of which at least 7 have good visibility. Bands are tied about the neck by the falconer's jesse knot. They can be made rapidly at cost of less than 6¢ each and can be applied in 15-30 seconds. There is no indication that behavior or condition of a marked bird is affected.

Fisher, Harvey I. (U. Ill.) APPARATUS TO MEASURE FORCES INVOLVED IN THE LANDING AND TAKING OFF OF BIRDS. Am. Midl. Nat. 55(2): 334-342, 4 figs. Apr. 1956.

The apparatus described and illustrated could be modified for study of many other kinds of animal movements. "Adaptations could be made to measure the force with which a grasshopper lands, with which a bird scratches, a frog or rabbit jumps, or the kick-off force of a sprinter or the force of a foot of a runner in full stride."

Grieb, Jack R., and Mitchell G. Sheldon. (Colo. Game Dept., Ft. Collins.) RADIO-CONTROLLED FIRING DEVICE FOR THE CANNON-NET TRAP. J. Wildl. Mgt. 20(2): 203-205, 3 figs. Apr. 1956.

A new method is described for firing the trap by radio control, thus eliminating wires from trapsite to blind. Traps have been fired successfully by this method from distances up to 1.5 mi. The method proved satisfactory in operations. Equipment used was: (1) a propelling charge of black powder loaded in a shotgun shell and primed with an electric squib; (2) the radio receiver packed in a plywood box with necessary batteries, buried at the trapsite; and (3) the portable transmitter. Radio gear consisted of one BCR-3 receiver, one BCT-2 transmitter, and one BCR-3 installation kit. Detailed instructions are given for wiring and type of batteries.--J. R. Grieb.

Klonglan, E. D., I. A. Coleman, and E. L. Kozicky. (Iowa State Coll.) A PHEASANT NEST ACTIVITY RECORDING INSTRUMENT. J. Wildl. Mgt. 20(2): 173-177, 1 fig. Apr. 1956.

Plans are given for converting an automatic, 24-hour temperature recorder into a pheasant nest activity recorder. The importance of obtaining the activity pattern of nesting pheasant hens is discussed.--E. L. Kozicky.

McClure, H. Elliott. (406th Med. General Lab., APO 343, San Francisco, Calif.) METHODS OF BIRD NETTING IN JAPAN APPLICABLE TO WILDLIFE MANAGEMENT PROBLEMS. Bird-Banding 27(2): 67-73, 6 figs. Apr. 1956.

"Historically, bird netting was a privilege and pleasure of royalty and nobility. In the latter half of the 19th Century, during the Meiji Era, restrictions were relinquished and netting was widely practiced with resultant reduction of indigenous bird populations. At present it is under strict government control, but it is still a very interesting art. During the past three years I have had opportunity to work with netters actively engaged in catching birds for market. The methods that they use have excellent possibilities if applied to wildlife conservation or bird banding problems. Three of these will be described: (1) netting the shorebirds with the aid of inanimate decoys and a whistle, (2) netting of songbirds and hawks by use of live decoys, and (3) netting of nocturnal and roosting species without the use of decoys."

Turner, Lewis B. (US F&WS, Manteo, N. C.) IMPROVED TECHNIQUE IN GOOSE TRAPPING WITH CANNON-TYPE NET TRAPS. J. Wildl. Mgt. 20(2): 201-203. Apr. 1956.

On the basis of 5 yrs. experience, author makes many suggestions for selection of site, placement of cannons, baiting procedure, location and construction of blinds for operators, wiring of charges, preparation of charges, size of charges, care and handling of equipment, handling of birds, and special jacket for holding and handling individual birds.

Walker, Ernest P. (Natl. Zool. Park, D. C.) FIRST AID AND CARE OF SMALL ANIMALS. Animal Welfare Inst. 46 p., illus. 1955. [From J. Mamm. 37(2).]

Woodgerd, Wesley R. (Box 187, Miles City, Mont.) A TALLY COUNTER HOLDER. J. Wildl. Mgt. 20(2): 198-199, 1 photo. Apr. 1956.

Describes use of a magnetic knife or tool holder to hold tally counters in convenient working position while censusing animals. A caution is included against attempting to use this device with counters having plastic or alloy cases.--W. R. Woodgerd.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Beach, James E. (W. Va. Cons. Comm.) SOME EVALUATIONS OF HABITAT DEVELOPMENT WORK AND THEIR APPLICATIONS IN MANAGEMENT. Proc. NE. Sections Wildl. Soc. et al., 1956. 14 p., mimeo. May 1956.

The following is paraphrased from author's summary: A short review of evaluations of habitat development work in the NE. All of these evaluations are summarized in Table 1. Studies in N. Y. and W. Va. are discussed at greater length. In N. Y., evaluations of shrub planting, woodlot fencing, and small marsh work are largely completed. Appraisal of tree planting and other

problems is under way. In W. Va., evaluation work is active but still in early stages. The appraisals of both states are summarized as to objectives, methods, and results. Applications of evaluation findings in N. Y. are outlined. For more details than the text supplies, and for data on other evaluations, readers are referred to references cited and to sources listed in Table 1.

Branch of Game Management. TEXT OF SOME FEDERAL LAWS ON WILDLIFE PROTECTION / THE MIGRATORY BIRD TREATIES AND EXCERPTS FROM TITLES 16, 18, and 19, UNITED STATES CODE. US F&WS, Wildl. Leafl. 374. ii + 47 p. Mar. 1956.
Texts of a wide variety of laws under which F&WS operates.

Chapman, Floyd B. (Ohio Div. Wildl.) SOME BEHAVIOR CHARACTERISTICS OF MAMMALS USEFUL IN MANAGEMENT. J. Wildl. Mgt. 20(3): 293-297, 1 fig. July 1956.
Behavior traits of many kinds of animals may have value in management. One of these is homing behavior. Another is the tendency of many individuals of species that have restricted home ranges to remain in or close to the area where born, or where held in captivity. The latter is considered a manifestation of homing behavior and is termed "areal" or "site affinity" by author. Ohio studies on white-tailed deer, cottontail rabbit, and snowshoe hare are cited to show how seminatural propagation pens may be stocked with animals and these and their progeny later released to restore or increase local populations. A deer herd was established, a depleted hare population was re-established, and a local cottontail population was greatly augmented by taking advantage of the site affinity of animals reared or held in captivity in seminatural propagation pens. It is suggested that seminatural propagation pens be used for restoration of vanishing mammals that demonstrate areal affinity after release from such pens. The method might be used by sportsmen's clubs to improve cottontail populations on their own lands or by public agencies operating hunting areas where there is great demand for rabbits. Low cottontail populations prevailed on the Woodbury Wildl. Area, Coshocton Co., Ohio, until rabbits from propagation pens were released. The first year after stocking, the local rabbit population increased almost 100%. In the following year, after further stocking, it increased an additional 50%. It is suggested that stocking of these rabbits on the area where they were raised, coupled with the apparent areal affinity of these animals, overcame a "low population density threshold" and permitted a considerable increase in the local population.--F. B. Chapman. [It seems likely that this method could result in greater effectiveness and economy in establishing game birds in new localities.]

Dale, Fred H. (Patuxent Refuge, Laurel, Md.) RECENT CONCEPTS REGARDING THE IMPORTANCE OF GAME HARVESTS AS THEY AFFECT POPULATION LEVELS FROM YEAR TO YEAR. Proc. NE. Sections Wildl. Soc. et al., 1956. 1-11 p., mimeo. May 1956.
Appeared also, but without references, under title HOW MUCH GAME CAN WE SAFELY HARVEST? in Pa. Game News 27(8): 4-10, 5 photos. Aug. 1956.
The author cites numerous principles, examples, and references to show that many forms of resident game can stand and should receive heavier harvesting.

Freeburn, C. C. (Pa. Game Comm.) PROGRESS OF LAND MANAGEMENT IN PENNSYLVANIA. Proc. NE. Sections Wildl. Soc. et al., 1956. 12 p., proc. May 1956.
Tells what the Pa. Game Comm. is doing on owned or leased game lands. Procedures on which information is given include food plots, border cutting, forest cuttings, nursery operations, small marsh impoundment, chemical spraying, cooperation with Forest Service, winter feeding, game stocking, predator control, etc.

Sowls, Lyle K. (U. Ariz.) WILDLIFE CONSERVATION THROUGH COOPERATION. U. Ariz. Press. 1-32 p., illus. 1956.
A review of accomplishments of the Ariz. Coop. Wildl. Res. Unit since its inception in 1951. Most of the booklet consists of summaries of research projects conducted by students and staff of the Unit. It should be of interest to all persons concerned with wildlife management in the SW. Projects discussed are: relation of waterholes to wildlife; deer-food study in the Tonto Forest; biology and browse relationships of desert mule deer; foods, productivity, and management of whitetailed deer; biology and forest economics of Abert squirrel;

life history and management of mourning dove; reproduction of desert cottontail; history of wildlife in Ariz.; factors affecting numbers of Gambel's and scaled quail; trapping, life history, and management of javelina. Published and unpublished reports on which these summaries are based are cited on p. 32.

Steen, Melvin O. (Nebr. Game Comm.) HOW SOIL AFFECTS YOUR HUNTING. Mo. Cons. 17(9): 1-3, 5 photos. Sept. 1956. [A longer version of this paper, entitled THE INFLUENCE OF SOIL AND WATER ON ANIMAL NUTRITION, appeared in Land and Water 2(3): 28-31. Fall 1956.]

In addition to reviewing previously published data on the response of wildlife to soil fertility, Steen gives some new information on how Mo. animals benefited from recent droughts. It seems that drying improves the physical properties of clay soils and makes it possible for plants to root more deeply and obtain more nutrients, at least when some water becomes available. In the extremely dry year of 1954 and in the wetter year of 1955, breeding and survival of game animals was exceptionally high. Steen attributes this to good qualitative nutrition resulting from drought.

WILDLIFE--HUNTING AREAS & PROBLEMS

Dickey, Charles. (RD 2, Box 14-H, Harrisburg, Pa.) COMMERCIAL SHOOTING GROUNDS IN THE NORTHEAST. Proc. NE. Sections Wildl. Soc. et al., 1956. 1-6 p., mimeo. May 1956.

Discusses: distinctions between Commercial and Private Regulated Shooting Grounds, sizes of areas states should permit shooting grounds to use, length of shooting season that should be allowed, need of nonresident licenses for shooting grounds only. Shooting preserves have not increased to an objectionable extent. Their profit margin is usually narrow and their numbers will increase only gradually with demand of shooters for this type of service.

Dickey, Charles H., and others. SHOOTING PRESERVES / A COLLECTION OF REPRINTS. Sportsmen's Service Bureau, 250 E. 43rd St., N. Y. 17, N. Y. 36 unnumbered p., illus. 1956.

A compendium of information useful to operators of shooting preserves. Consists largely of the series by Dickey that constituted the Feb. 1956 issue of Modern Game Breeding (see WR 85: 13). Contains also: a study of shooting preserves, by Bill Wolf, from Sports Afield for Nov. 1955; 5 short papers from Modern Game Breeding on publicizing and managing shooting preserves; and a sheet of suggestions on use of sorghums.

WILDLIFE--ECONOMIC & OTHER VALUES

NATIONAL SURVEY OF FISHING AND HUNTING / A REPORT ON THE FIRST NATIONWIDE ECONOMIC SURVEY OF SPORT FISHING AND HUNTING IN THE UNITED STATES, DURING THE CALENDAR YEAR 1955. US F&WS, Cir. 44. ii + 50 p., graphs. Sept. 1956.

Report of nationwide sampling census made by Crossley S-D Surveys for Fish & Wildlife Service at request of Internat. Assn. Game, Fish & Cons. Comms. Results are presented first in large, popular graphs and then in tables. Techniques of the survey are explained in 2.5 pages. One in every 3 households had at least one hunter or fisherman. Of all persons 12 years of age or older, 10% hunted and 18% fished. Small game was hunted by 9.8 million people, big game by 4.4 million, and waterfowl by 2.0 million. One in 5 men hunted, but only 1 woman in 128. Percentages of hunters rose from 2% of those living in big cities to 16% of those living in rural areas. Nearly $3 billion was spent on hunting and fishing: $324 million on big game, $119 million on waterfowl, $494 million on small game, and $1,914 million on fishing. Hunters spent $489 million on equipment, $251 million on travel, $150 million on miscellaneous items, and $47 million on licenses. Hunters traveled 2,684,914,000 automobile-miles and more than twice that many passenger miles. One in 6 hunters was able to hunt without a license. The typical hunter spent $79.49, hunted 8.5 days, took 5.5 trips, and drove 206 miles. Hunting provided 169,423,000 days of recreation. These and other data are detailed for regions of the country and for sex and age groups of persons who hunted and fished.

WILDLIFE--FOOD HABITS & TECHNIQUES

Krochmal, Arnold. (Cornell U.) SEEDS OF WEEDY EUPHORBIA SPECIES AND THEIR IDENTIFICATION. Weeds 1(3): 243-255, 27 figs. Apr. 1952.
Includes key to and drawings of seeds. Twenty-seven species are treated.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Davis, R. K. LARCENY IN THE HENHOUSE. Ohio State U., Agr. Ext. Serv., Bul. 349. 1-8 p., 5 cartoons. Nov. 1955.
How to recognize and control predation on poultry by prevention and trapping of offending individuals. The section on identifying predators by marks they leave on poultry seems unusually good.

Hanlon, Robert W. (Dept. Biol., St. Augustine's Coll., Nassau, Bahamas.) BOUNTY--BIG BUSINESS IN MINNESOTA. Minn. Nat. 7(1): 1-4, 4 figs. Mar. 1956.
State and county bounties on various species cost Minn. over a quarter of a million dollars a year. They seem to do little good. A graph shows that fox populations fluctuated widely, 1943-55, in spite of bounty. Another graph shows wolf bounties paid, 1949-55. There is evidence that fraud occurs, and much fraud is possible. Furthermore, there is little uniformity of payments in different counties.

Riney, Thane. (N. Z. For. Serv., Wellington.) COMPARISON OF OCCURRENCE OF INTRODUCED ANIMALS WITH CRITICAL CONSERVATION AREAS TO DETERMINE PRIORITIES FOR CONTROL. N.Z. J. Sci. & Tech., Ser. B, 38: 1-18, 6 maps. July 1956.
Summary: "Areas listed as critical from the conservation aspect [for any biological or economic reason] by several government departments are described and mapped for comparison with the distribution and density of two introduced mammals, the red deer (Cervus elaphus) and brush-tailed possum (Trichosurus vulpecula). It is shown that, although government-financed control efforts have been mainly directed at areas containing the highest densities of these animals, this does not necessarily result in maximum relief to problems of conservation. This comparison demonstrates the need clearly to define cause-effect relations (problems) between introduced animals and areas regarded as critical. Priorities for control efforts should be based on the degree to which an area is critical to the conservation interests of New Zealand rather than on its ability to sustain high densities of animals."

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Agee, Phil. (Nebr. Game Comm.) 1955 KILL SURVEY. Outdoor Nebr. 34(2): 22-23, 2 figs. Spring 1956.
Post-card survey indicated that in 1955 licensed Nebr. hunters bagged 661,882 ducks, 13,557 geese, 466,113 pheasants, 72,285 quail, and 15,259 grouse. Kill of ducks was nearly double that of 1954. Kill of geese was about the same as in 1954. The bag of nearly half a million pheasants was not bad considering that pheasants were exceptionally low. Many more quail might well have been shot. The grouse were about 64% sharptails and 36% prairie chickens. Thus, over 5,000 prairie chickens were bagged in the state. A graph shows kill of pheasant and quail by quarters of hunting season; bags declined gradually. Pheasant hunters got not twice as many but 1.5 times as many birds as they would have in a season of half the length. Take of quail declined somewhat less as season progressed. [It is clear from the graph that length of season cannot be dismissed lightly as a harvest-control measure.]

Cape of Good Hope. DEPARTMENT OF NATURE CONSERVATION / REPORT NO. 12 / 1955. Prov. Admin., Cape of Good Hope, Dept. Nat. Cons., P. O. Box 152, Stellenbosch, S. Africa. 79 p., illus. Rec'd. Sept. 1956.
An interesting and somewhat encouraging account of the status of wildlife in the Cape Province and progress in its conservation. Conservation education is having gradual effect and the regulatory system is growing and improving. On the other hand, the conservation staff is extremely small and authority is mainly in the hands of local governments that have little interest in wildlife. Officially-paid bounties on nearly 30 species devour huge sums and show few

desirable results. Game species are shot without bag limits and without knowledge of status. Application of the principle of sustained yield is not yet in sight. Some nearly extinct forms are still classed as "vermin." Laws for bird protection are better but still inadequate. The cage-bird trade still endangers local populations. As in America, predatory birds are generally shot on sight regardless of their value. An important paper of the report is "A first census of the wildlife of the Cape Province," by R. W. Rand. Based on questionnaires and illustrated by maps, it gives data on distribution and relative abundance of many kinds of game and predatory mammals. Apparent increases and decreases are noted. Rand also comments on the bounty system, on hunting as now done, and on the need for data on which management could be based.

Idaho. SUMMARY OF OPERATIONS 1955 / IDAHO DEPARTMENT OF FISH AND GAME. iv + 53 p., proc. 1956?

Included in this general account of activities and finances are data on: results of big-game hunting, 1953 and 1954; pheasant sex ratios in various districts; pheasant hunting statistics; results of mid-winter waterfowl counts, 1951-55; game-farm birds released; work done on management areas; work done on habitat improvement on private lands; fur animals reported as trapped; and predators destroyed.

New Mexico. BRAND OF PROGRESS / ANNUAL REPORT NEW MEXICO DEPARTMENT OF GAME AND FISH JULY 1, 1954-JUNE 30, 1955. 1-36 p., illus. 1956.

An interesting, narrative-type report designed for the public. It includes information on status and harvests of major game species, on abolition of refuges, production of game farm, predator control, and a little information on effect of drought on game conditions. All PR projects are described briefly.

North Dakota. ANNUAL REPORT NORTH DAKOTA GAME & FISH DEPARTMENT JULY 1, 1954 TO JUNE 30, 1955. 1-49 p., illus. 1955?

Includes data on progress of the habitat improvement program; an outline of plans for evaluation of habitat developments; status of pheasant, sharptail, and Hungarian partridge; status and harvests (1948-54) of fur species; status and harvest of mule and whitetail deer; kill of pronghorn; and reports of work on management areas. Information on management studies of game animals are worked in briefly throughout the report.

Oregon. 1956 ANNUAL REPORT / OREGON STATE GAME COMMISSION / GAME DIVISION. vi + 178 p., sketches & graphs. 1956.

This is the game encyclopedia that Ore. publishes annually. It is not an ordinary administrative report but a compilation of freshly gathered data on all sorts of Ore. game. Species by species, and in detail, with numerous tables, facts and figures are given on status, production, population trends, kills, sex ratios, and hunting statistics. Take of fur animals and predators is reported. Projects of Ore. Coop. Wildl. Res. Unit are reported in long summaries. Management work done for big game, small game, and waterfowl is also reported.

Saskatchewan. ANNUAL REPORT OF THE DEPARTMENT OF NATURAL RESOURCES FOR THE FISCAL YEAR ENDED MARCH 31, 1955. xii + 94 p., 49 figs. 1956.

Report of Game Branch occupies pages 20-43. It includes graphs showing number and value of pelts taken, 1946-55, of fisher, muskrat, beaver, squirrel (red), mink, weasel, lynx, otter, fox, marten, and coyote. A table shows number and value of pelts of each fur species taken 1953-55. The rest of the report gives general information on status and harvests of game species, management policies, research projects underway, and discusses the new system of insuring farmers against crop damage by wildlife. The province was divided into 51 areas for management purposes. Moose were up despite 2 open seasons in 9 years and were hunted in 14 of the areas. An either-sex season was opened on pronghorns in 7 areas. Populations of woodland caribou were higher. Waterfowl populations were high for 4th consecutive year. No bounties were paid on wolves or coyotes, but control by poisoning and cyanide guns was effective.

South Dakota. ANNUAL REPORT, 1954-1955, DEPARTMENT OF GAME, FISH AND PARKS. 1-206 p., illus. 1956?

The section on wildlife (p. 180-205) is a factual, narrative-type report. It gives considerable information on status and harvests of deer, antelope, and elk. The deer problem in the Black Hills has been lessened by hunting but still is not good. Antelope herds required local reductions for crop protection but remain sound. Mountain goats should be harvested; some are being transplanted to new areas. Data are given on status of sage grouse, Hungarian partridge, and ruffed grouse; the first 2 of these should be hunted. Pheasant production, management, and harvest are discussed. Status, production, and harvests of sharptailed grouse, prairie chicken, turkey, and waterfowl are considered. Work done in developing game cover on farms, in improving management areas, and in land acquisition is described. Plans to evaluate results of the game-cover program had to be abandoned because of time and cost involved.

Texas. ANNUAL REPORT OF THE GAME AND FISH COMMISSION...FOR THE FISCAL YEAR 1954-1955. 1-74 p. 1955?

Largely a fiscal report. Several pages are devoted to describing projects and what has been done on them. Data are tabulated for all transplants of game, and for all land purchases. A quail hatchery was built; policy is to provide quail only for areas suitable for them and where they are needed. The predator control program was discontinued in the spring of 1955. It is interesting to note that state trappers took 35 pumas during the year as well as 4,417 bobcats and 24,006 coyotes.

WETLANDS & WILDLIFE

Anon. MARSH PRODUCTIVITY. N. Y. State Cons. 11(1): 37. Aug.-Sept. 1956.

"Records of fur catch from a recently impounded marsh area in Indiana emphasize the tremendous wildlife productivity of wetlands when properly managed. This 1,500-acre marsh called Willow Slough was first flooded in 1952. During the 1952 trapping season, 677 muskrats, 21 mink, 17 raccoons and three opossum were harvested. By 1954 the harvest increased to 1,984 muskrats, 15 mink, 39 raccoons, 12 beaver and 12 opossums. Over the four-year period the area produced muskrats averaging one-half pound heavier than those taken in adjacent areas of the state. And the fur harvest is an extra dividend of Willow Slough's principal function as a waterfowl production area." [Complete.]

Mathiak, Harold A., and Arlyn F. Linde. (Wis. Cons. Dept.) STUDIES ON LEVEL DITCHING FOR MARSH MANAGEMENT. Wis. Cons. Dept., Tech. Wildl. Bul. no. 12. 1-49 p., 5 figs., 7 photos. 1956.

Revision, with new data, of Tech. Wildl. Bul. no. 5 of 1953. Creation of nondrainage ditches in nearly dry marsh or bog greatly improves habitat for furbearers, waterfowl and fish. Dredging, with high spoil banks, was much superior to blasting, both in costs and results. Spoil banks (grassed) deteriorated little in 6 years. Ditches, however, tended to fill with muck because of muskrat burrowing. One ditch was completely filled during low water in 1953. Hence, the ditches remained highly productive for muskrats for only 6 years. They still retain some value for muskrats and much for waterfowl and upland game. Muskrat populations, movements, and die-off are described. Muskrat harvest was 4-10 times as great per acre in ditched as in unditched marsh. Ditches were tried with spacing of 50, 100, 200, and 400 feet. Closer spacing produced more muskrats per acre, but 200-foot spacing is recommended because of its ratio of yield to cost. Muskrat travel away from ditches was slight except when population was high in 1952. About 75% of population should be trapped to prevent egress. Money spent on ditches can be recovered from muskrats alone in 4 years. Quite a few mallards and blue-winged teal nested in the area. Value of ditching might be greater in the long run for waterfowl than for muskrats, at least under some circumstances.

Patten, Bernard C., Jr. NOTES ON THE BIOLOGY OF MYRIOPHYLLUM SPICATUM L. IN A NEW JERSEY LAKE. Bul. Torrey Bot. Club 83(1): 5-17, illus. Jan.-Feb. 1956.

At Lake Musconetcong this is a serious weed. It has an affinity for alkaline situations and aids in maintaining alkalinity. Nearly all new growth is from vegetative parts, little or none from seeds.--Neil Hotchkiss.

Segadas-Vianna, Fernando. (Museu Nacional, Rio de Janeiro.) ECOLOGICAL STUDY OF THE PEAT BOGS OF EASTERN NORTH AMERICA. II. THE CHAMAEDAPHNE CALYCULATA COMMUNITY IN QUEBEC AND ONTARIO. Can. J. Bot. 33(6): 647-684, illus. Nov. 1955.--Neil Hotchkiss.

Shaw, Samuel P., and C. Gordon Fredine. (US F&WS.) WETLANDS OF THE UNITED STATES / THEIR EXTENT AND THEIR VALUE TO WATERFOWL AND OTHER WILDLIFE. US F&WS, Cir. 39. iv + 67, 12 figs., 21 pl. 1956. $1.00 from Supt. Documents.

This is the long-awaited summary of the Wetlands Inventory. It is a review and public-relations publication rather than a detailed scientific report or work plan. The first 2 chapters discuss the disposition and exploitation of our swamps and marshes and problems of saving the remainder. Chapter 3 tells about wetland soils, their sources and values. Chapter 4 tells how the inventory was made and gives a table showing acreages of wetlands of 4 categories of value to waterfowl in each state. Chapter 5 describes the 20 wetland types recognized in the inventory. Chapter 6 gives a general picture of how the inventory can be used in planning for water control and land use, flyway management, wetland preservation and development, and encouraging local wetland projects. Chapter 7 tells how refuges and public shooting grounds serve waterfowl. We need at least 12.5 million acres of such lands intensively managed by state and federal agencies. This objective is now about 40% realized. Chapter 8 reviews some ways in which wetlands can be managed and improved for waterfowl. Chapter 9 demonstrates the great value of wetlands to game other than waterfowl. At least 50 game and fur species exclusive of waterfowl utilize wetlands, and values of these animals deserve fully as much consideration as those of waterfowl. Some wetlands of low waterfowl importance are of great importance to other game or fur species. Plates depict samples of each wetland type. Accompanying maps show locations and approximate extent of the types. Eight tables supply figures on the drainage situation, extent of each wetland type, and use of the wetland types by various game and fur animals.

Vesall, David B. (Minn. Dept. Cons.) WETLANDS ACQUISITION & MANAGEMENT. Cons. Volunteer 19(112): 1-8, 1 map, 2 photos. July-Aug. 1956.

Marshes and potholes of Minn. are being drained at the rate of 5% a year rather than the 3% estimated a few years ago. It has been possible to persuade farmers against only about 10% of proposed drainage projects. The state's aim is purchase of 209,000 wetland acres in 65 agricultural counties at cost of $6,500,000. This aim was 11.5% realized by June 1956, largely through PR funds. The "Save Minnesota's Wetlands" fund has raised nearly $10,000 for purchases and has had public relations value. Purchased wetlands are managed by such techniques as fencing, share cropping, level ditching, creation of nesting islands, cover planting, control of water levels, construction of carp barriers (cheap and effective), and provisions for access. State laws now allow tax reduction on wetlands reserved for wildlife, encourage muskrat farming, and require consideration of wildlife in planning ditching. The last gives at least some legal backing for protection of wildlife interests on state-owned lands. Other legal tools are being designed. Hope was held for the small watershed projects that are being organized, but study of plans for the first 12 indicated that 5 involve extensive drainage and hence may accelerate and increase loss of wetlands.

FARMLAND & WILDLIFE

Batson, Wade T., and Robert N. Tulloch. (U. of S. C.) AN ECOLOGICAL STUDY OF THE LAND PLANTS AND COLD-BLOODED VERTEBRATES OF THE SAVANNAH RIVER PROJECT AREA. Part IV. SUCCESSION IN FIELDS OF THE SAVANNAH RIVER PROJECT AREA. 2. THE FLORISTIC COMPOSITION OF LOWLAND FIELDS IN THE THIRD YEAR OF ABANDONMENT. U. of S. C. Publ., Ser. 3, Biol., 1(4): 220-226. Jan. 1955.

Quadrat data tabulated for 3 low fields near Savannah River.

Byrd, Mitchell A. (Coll. Wm. & Mary.) RELATION OF ECOLOGICAL SUCCESSION TO FARM GAME IN CUMBERLAND COUNTY IN THE VIRGINIA PIEDMONT. J. Wildl. Mgt. 20(2): 188-195. Apr. 1956.

Qualitative quadrat studies of trend of plant succession on abandoned crop fields in Piedmont Va. indicated a dominance by crabgrass (Digitaria sanguinalis) in 1-year fields progressing to dominance by Pinus virginiana in 25-year fields. Fields may be classified into 4 groups on basis of floristic composition: Succession Class I (1-year fields), Class II (2-4 years), Class III (5-10 years), and Class IV (11-25 years). Trap lines for rabbits and census lines for quail and rabbits were run in each successional class. Analyses of data indicated that abandoned fields were most desirable for quail and rabbits during the first through fourth years after abandonment. Maintenance of abandoned fields of these ages would be a valuable wildlife management practice. Efforts should be directed toward altering and holding plant succession in Classes I and II.--M. A. Byrd.

Davis, R. K. MULTIFLORA ROSE. Ohio State U., Agr. Ext. Serv., Bul. 350. 1-8 p., 6 figs. Apr. 1956.

This bulletin for farmers is a concise statement of how and why to grow rose hedges. Some interesting points from it are: Multiflora is the cheapest fence to install and the cheapest to maintain. Hungry sheep can eat through a hedge that is no more than 6 yrs. old. Birds spread the seeds, but mowing, grazing, and ploughing kill the young plants so they are no problem on used land. Rose is no harder to kill or remove than many native plants. Crops next to a rose hedge are actually better than those in rest of field, probably because of moisture conservation. Rose has been used with only limited success on strip-mine spoil banks and highway banks. Songbirds nest in the hedges. Game animals use hedges as travel lanes and escape cover. Multiflora needs clumps of pines and grass strips to make good winter cover. In general, however, trees should not be allowed to grow up in or overhang a rose planting.

Kelley, Wm. R., and Wade T. Batson. (U. of S. C.) AN ECOLOGICAL STUDY OF THE FAUNA AND FLORA OF THE SAVANNAH RIVER PROJECT AREA. IV. SUCCESSION IN FIELDS OF THE SAVANNAH RIVER PROJECT AREA. 3. A SUMMARY OF THE SPECIES PERFORMANCE OF PLANTS IN UPLAND FIELDS DURING THE THIRD, FOURTH, AND FIFTH YEARS OF ABANDONMENT. U. of S. C. Publ., Ser. 3, Biol. 2(1): 22-25. Mar. 1956.

Brief review of changes in species composition.

Klimstra, W. D. (S. Ill. U.) PROBLEMS IN THE USE OF MULTIFLORA ROSE. Ill. Acad. Sci. Trans. 48: 66-72. 1956.

Important paper based on study of 219 plantings 1-15 yrs. of age in Ill. and Iowa. Eighteen percent of the plantings were serviceable, 36% were repairable, and 46% were inadequate. Nearly 70% of farmers were dissatisfied. Responsible were poor site selection, poor early care, and overadvertising. Many plants suffered winter-kill of canes, some froze to death. Local topography is important in cold-damage. Much evidence was obtained of spreading by seeds and layering. Seedlings thrived under mowing in one pasture; it seemed unlikely that an ordinary mower could handle them after a few years. Such facts were new to farmers and angered them. Survey of literature and field data provided little evidence of value of multiflora to wildlife, except where adjacent food supply was readily available. Perhaps use of multiflora should be limited to areas where no other cover exists and chances for invasion of idle land are minimal. "In those regions where agriculture is less intense and natural succession of woody vegetation and idle land relatively common, planting of multiflora rose is believed not only unwise but in general unnecessary, for natural conditions probably offer much more for wildlife. The emphasis now being placed on multiflora in the south and southeast might well result in the establishment of another nuisance plant in those regions... The assumption that multiflora will answer all the problems created by the advent of grassland farming is unfounded."

Myers, Marvin S. NATURE'S 20-MINUTE HELPER. Md. Cons. 33(3): 16-17, 4 photos. May 1956.

Shows simple flushing bar made by tacking a couple of feed bags, preferably white, to 10-12 ft. pole (cut from sapling) which is tied or otherwise fastened to front of tractor. No data are given on how well the empty bags would flush animals.

Tulloch, Robert N., and Wade T. Batson. (U. of S. C.) AN ECOLOGICAL STUDY OF THE LAND PLANTS AND COLD-BLOODED VERTEBRATES OF THE SAVANNAH RIVER PROJECT AREA. IV. SUCCESSION IN FIELDS OF THE SAVANNAH RIVER PROJECT AREA. 1. THE FLORISTIC COMPOSITION OF UPLAND FIELDS IN THE THIRD YEAR OF ABANDONMENT. U. of S. C. Publ., Ser. 3, Biol., 1(3): 173-180. Feb. 1954.
Introduction describes fields and methods. Tables present quadrat data for species.

RANGELAND & WILDLIFE

Blaisdell, James P., and Walter F. Mueggler. (Intermtn. For. & Range Exp. Sta., Ogden, Utah.) SPROUTING OF BITTERBRUSH (PURSHIA TRIDENTATA) FOLLOWING BURNING OR TOP REMOVAL. Ecol. 37(2): 365-370, 5 figs. Apr. 1956.
Study of basal sprouting, which is common in e. Idaho.

Holmgren, Ralph C. (Intermtn. For. & Range Exp. Sta., Ogden, Utah.) COMPETITION BETWEEN ANNUALS AND YOUNG BITTERBRUSH (PURSHIA TRIDENTATA) IN IDAHO. Ecol. 37(2): 370-377, 2 figs. Apr. 1956.
Young bitterbrush seedlings cannot compete well with grasses and forbs. "Removal in the fall of a 2-inch layer of soil from the surface of a plot is an effective method of eliminating the crop of annual weeds the following year. The principle of this scalping is to remove weeds and weed seeds at the same time." Weather factors are also considered.

Kucera, C. L. (U. Mo.) GRAZING EFFECTS ON COMPOSITION OF VIRGIN PRAIRIE IN NORTH-CENTRAL MISSOURI. Ecol. 37(2): 389-391, 1 fig. Apr. 1956.
Grazing, trampling, mowing, and prolonged drought caused severe deterioration of tall-grass prairie. Sharp reductions of several native plants occurred and various invaders appeared. There was a 41% decrease in number of plant species. Intensive utilization by livestock modified the original composition in a relatively short period of time.

Lehrer, W. P., Jr., and E. W. Tisdale. (U. Idaho.) EFFECT OF SHEEP AND RABBIT DIGESTION ON THE VIABILITY OF SOME RANGE PLANT SEEDS. J. Range Mgt. 9(3): 118-122. May 1956.
Seeds of 7 western range plants were fed to domestic sheep and domestic rabbits. The proportion of viable seeds recovered from droppings was relatively small. Some seeds were viable after being in sheep for as much as 9 days or rabbits 4 days. It is concluded that sheep or rabbits could carry seeds of desirable or undesirable range plants for long distances and thus hasten their spread.

Longhurst, William M. (U. Calif. Field Sta., Hopland, Calif.) STUMP SPROUTING OF OAKS IN RESPONSE TO SEASONAL CUTTING. J. Range Mgt. 9(4): 194-196. July 1956.
Study of effect of cutting Quercus douglasii, kelloggii, dumosa, and wislizenii on sprout production for deer and livestock on foothill range of Calif. Quantitative results are given. "From a management standpoint, it appears that it would be best to cut interior live oaks and scrub oaks [wislizenii and dumosa] for stump sprouts. They are less sensitive to the season of cutting than the deciduous species and are better able to withstand heavy browsing. In addition more benefit would be derived by releasing growth of grasses and forbs under the evergreen oaks. Understory plants are virtually excluded by these species while deciduous oaks, especially blue oaks, have a considerable density of grasses and forbs growing beneath them. This...is most suitable...where there is moderate to heavy pressure from livestock and deer since if the stump sprouts are not kept hedged they will soon grow out of reach."

Nord, Eamor C. (Calif. For. & Range Exp. Sta., Berkeley.) QUICK TESTING BITTERBRUSH SEED VIABILITY. J. Range Mgt. 9(4): 193-194, 2 figs. July 1956.

Shepherd, Harold R. (Colo. Dept. Game.) DON'T SPARE THAT OAK! Colo. Outdoors 5(4): 24-26, 3 figs. July-Aug. 1956.

Colo. has many deer winter ranges where oakbrush has grown out of reach of game. Experiments have shown that cutting strips by axe or by breaking by bulldozer results in much sprouting and greatly increased browse. Deer and cattle use the sprouts heavily and also eat the twigs from the felled trees. All ages of deer are helped and so are hunters. The work is recommended to sportsmen's groups.

Weaver, J. E., and F. W. Albertson. GRASSLANDS OF THE GREAT PLAINS / THEIR NATURE AND USE. Johnsen Publ. Co., Lincoln 8, Nebr. ix + 395 p., 93 figs. 1956. $6.50.

Weaver's recent book, "North American Prairie," (see WR 78: 77) dealt with the true prairie. Here is a companion volume on the area just to the west, the Great Plains. Geological origin and soils of the plains are described. Important grasses and forbs are treated individually and associations of them are discussed. Drought, grazing, and successions receive much attention throughout. Each region of the plains, from N. M. into Canada, is treated in special chapters. The book is based on many detailed research studies and 233 references are cited. It should be a useful reference and a source of background for anyone concerned with ecology, use, and conservation of the Great Plains. It is written in simple and relatively nontechnical style and is thus suitable for any seriously interested reader. Most of the 93 figures are really plates that contain 2 or 3 photos showing plants, types of grasslands, degrees of misuse, root systems, and the like. The book will be of use to wildlife biologists because of the great amount of information it brings together on ecology, values, and management of various types of grasslands. Wildlife itself, however, is given no special mention.

FORESTLAND--FORESTRY & ECOLOGY

Anon. CONTROLLED BURNING...USING FIRE WISELY. Fla. For. Serv., Tallahassee. iii + 11 p., 9 figs. Feb. 1956.

Good directions for safe use of fire for forestry purposes in Fla. slash-longleaf pine type.

Anon. TOO MUCH GRAZING. Ohio Cons. Bul. 20(6): 29. June 1956.

Nearly 1 out of every 3 acres of woodland in Ohio is grazed. Grazing is considered a greater hazard than fire and poor cutting combined. Forest reproduction has been nearly eliminated on more than half a million acres. In all, 1,605,000 acres are grazed--about half of the farm-owned woodlands. Grazing not only injures young growth, it is also detrimental to water conservation. Trampling by cattle tends to pack soils and hinder insoak, thus increasing runoff. Proportions of woodlands grazed in different watersheds of Ohio are stated. The proportion is greatest in the Great Miami Watershed, where 3 out of 4 acres are pastured.

Clovis, Jesse Franklin. ECOLOGICAL ASSOCIATION TYPES IN THE ITALY HILL, N. Y., SWAMP AREA. Ph. D. thesis, Cornell U. 176 p. 1955. [From abstract in Dissertation Abstracts 16(5).]

Ecological study of vegetation of a virgin swamp and adjoining areas.

Fuller, W. H., Stanton Shannon, and P. S. Burgess. (U. Ariz.) EFFECT OF BURNING ON CERTAIN FOREST SOILS OF NORTHERN ARIZONA. For. Sci. 1(1): 44-50. Mar. 1955.

Hepting, George H. (SE. For. Exp. Sta., Asheville, N. C.) THE CURRENT STATUS OF OAK WILT IN THE UNITED STATES. For. Sci. 1(2): 95-103, 3 figs. June 1955.

Good survey of cause, distribution, and control.

Lutz, H. J. (Yale U.) ECOLOGICAL EFFECTS OF FOREST FIRES IN THE INTERIOR OF ALASKA. USDA Tech. Bul. no. 1133. ii + 121 p., 22 figs. Mar. 1956. 40¢ from Supt. Documents.

An important, detailed bulletin that will be of value to workers in several fields. Fires in Alaska are numerous, extremely severe, and cover huge areas. Almost all areas have been burned time and again. Lutz gives a well-rounded treatment of the situation, with emphasis on forestry and ecology. He begins with much information on geographic conditions and proceeds into an exhaustive discussion of fire effects on timber, ecological succession, and soils. Effects of fire on wildlife are reviewed in a few pages. It is shown that fires are exceedingly injurious to fur animals, caribou, and their habitats. Fires may improve moose range and populations, but they do not always do so. Lutz gives reasons for believing that the value of fire to moose has been overestimated. Moose have been extending their range independently of fire. Evidence is given that moose were present on the Kenai Peninsula before the great fire of 1883, contrary to some statements. Future work in Alaska is expected to prove the value of controlled burns for certain aspects of forestry and wildlife management. The severe wildfires that now denude the territory are highly detrimental to resources. The author quotes many authors, some of them foreign, and supplies a good, diversified bibliography of 165 titles. Appendixes list plant names and give tabular reports of soil analyses.

Reynolds, R. R. (S. For. Exp. Sta., New Orleans, La.) UPLAND HARDWOODS IN SOUTH ARKANSAS PINE STANDS--AERIAL OR UNDERGROUND FIFTH COLUMN? J. For. 54(9): 585-586, 2 photos. Sept. 1956.

Conclusions: "This study indicates that hardwoods are usually old residents in shortleaf and loblolly pine forests, and not sudden invaders. The only way to reduce them to reasonable numbers is to choose control methods that kill most of the rootstocks as well as the above-ground stems. When hardwoods of seedbearing size are to be left in pine stands, whether for timber growth or to produce game food, they should be grouped rather than scattered on every acre. This would minimize the rate of spread from either seed or roots. The groups should, if possible, be near branch heads, along small streams, or on other sites where hardwoods grow well enough to produce good timber and game food."

Rowe, J. S. (Fed. For. Branch, Winnipeg, Can.) USES OF UNDERGROWTH PLANT SPECIES IN FORESTRY. Ecol. 37(3): 461-472, 2 figs. July 1956.

Good discussion of how to use understory plants to interpret conditions of a site without study of soil and weather. The study is based on work in mixedwoods forest of Man. and Sask.

Sharpe, Grant William. A TAXONOMICAL-ECOLOGICAL STUDY OF THE VEGETATION BY HABITATS IN EIGHT FOREST TYPES OF THE OLYMPIC RAIN FOREST, OLYMPIC NATIONAL PARK, WASHINGTON. Ph. D. thesis, U. of Wash. 335 p., 66 photos. 1956. [From long abstract in Dissertation Abstracts 16(6).]

Detailed, qualitative and quantitative study of the rain forest vegetation and environmental factors. Both phanerogams and cryptogams were studied. Much of the data is based on analysis of 176 plots of 10,000 sq. ft. each. Relation of Roosevelt elk to vegetation is discussed.

Spurr, Stephen H. (U. Mich.) NATURAL RESTOCKING OF FORESTS FOLLOWING THE 1938 HURRICANE IN CENTRAL NEW ENGLAND. Ecol. 37(3): 443-451. July 1956.

Information on successional trends on different types of sites in blowdown areas.

Spurr, Stephen H. (U. Mich.) FOREST ASSOCIATIONS IN THE HARVARD FOREST. Ecol. Monog. 26(3): 245-262, 8 figs. July 1956.

Based on personal studies and 40 years of recorded forest history. The forest is at Petersham, Mass. From summary: "The present forest associations are apparently complex, but turn out to be fairly simple in their broad aspects, being closely related to soil drainage and to successional stage. A well defined series of gradational stages relate white pine on very well drained sites to spruce on very poorly drained ones. On well drained sites, short-lived species such as gray birch, cherries, and aspen characterize pioneer associations, with white pine as the principal old-field species. The

transitional association is basically a red oak-red maple type, with other hardwoods making up minor proportions of the stand. In late successional stages, hemlock and occasional white pine join with red oak to make up the basic association."

Tarrant, Robert F. (Pac. NW. For. & Range Exp. Sta., Portland, Ore.) CHANGES IN SOME PHYSICAL SOIL PROPERTIES AFTER A PRESCRIBED BURN IN YOUNG PONDEROSA PINE. J. For. 54(7): 439-441, 3 figs. July 1956.

Ward, Richard T. (Beloit Coll.) THE BEECH FORESTS OF WISCONSIN--CHANGES IN FOREST COMPOSITION AND THE NATURE OF THE BEECH BORDER. Ecol. 37(3): 407-419, 4 figs. July 1956.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Berner, Lester M. (S. Dak. Dept. Game.) FORESTRY IN RELATION TO WILDLIFE MANAGEMENT. S. Dak. Cons. Digest 23(6): 1, 5, 13-14. June 1956.

What foresters can and should do in the way of wildlife management. Some of the things they should do are: Consider wildlife as one of the important products of forest land. Manage some parts of some forests primarily for wildlife and recreation. Keep track of changes in amount of forage produced by thinnings and other cuttings. Prevent silting of waters from road construction and road erosion. Develop more and better roads into areas where hunting is--or will be--needed. Plant shelterbelts of types that won't become graveyards of game birds in winter. Don't be too quick to replant small burns--they provide valuable edge. In replanting large burns, use a checkerboard pattern that will provide much edge. Where necessary, have state laws changed to give foresters authority to practice true multiple use. Remember that it really can be good multiple use to have on forest land a few brush piles, unplanted clearings, unthinned thickets, fallen logs, and wolf trees.

Burke, Hubert D. (S. For. Exp. Sta., New Orleans, La.) GAME HABITAT AND THE MULTIPLE USE OF SOUTHERN FOREST RANGES. J. Range Mgt. 9(4): 164-166. July 1956.

Summary: "Most southern ranges are forest ranges. Now that forest cover is returning to large areas of cutover land, the close correlation of livestock and wildlife management with timber management plans becomes necessary. Deer, which were absent or scarce in most areas twenty years ago, are now numbered by thousands and are increasing rapidly. Range management must be based on methods of forage analysis that consider both wildlife and livestock forage. Information must be secured on the response of forage to various timber-harvesting methods, the establishment of reproduction, and the use of controlled burning."

Lay, Daniel W. (Texas Game Comm., Buna.) EFFECTS OF PRESCRIBED BURNING ON FORAGE AND MAST PRODUCTION IN SOUTHERN PINE FORESTS. J. For. 54(9): 582-584. Sept. 1956.

For informative summary, see WR 83; 12. Conclusions: "The value of prescribed burning as a tool for improving forest habitat for wildlife varies with the species and the locality. For deer the benefits increase as the understory succession moves away from optimum conditions of height and density. Care must be taken against the possibility of damaging one key species where other species and improvements in condition and quality cannot make up the loss. This possibility seems to be rare and in general fire is unlikely to damage deer range. Squirrels, turkeys, deer and quail suffer some loss of food in the general reduction of understory mast. The gains in herbs and improvement of understory condition definitely favor quail and probably favor turkeys. Burning may result in a net loss for squirrels, depending upon the importance of understory mast."

McNally, J. (Game Dept., 605 Flinders St., Melbourne C.3, Australia.) DAMAGE TO VICTORIAN EXOTIC PINE PLANTATIONS BY NATIVE ANIMALS. Australian Forestry 19(2): 87-99, 6 photos. 1955.

Severe damage is done to pines (primarily R. radiata) by animals that strip bark and eat cambium at times of food shortage. Animals chiefly responsible are mountain possum (Trichosurus caninus), brush-tailed possum (Trichosurus

vulpecula), black-tailed wallaby (Wallabia bicolor), and allied rat (Rattus assimilis). Damage is described and illustrated. As many as 79% of trees in a plantation may be damaged, many of them seriously. Suggestions are made for control by removal of low cover and for poisoning, trapping, and snaring. Apparently little information is yet available on control methods that can be used successfully under local conditions.

Spencer, Donald A. (US F&WS, Denver 2, Colo.) THE EFFECTS OF RODENTS ON REFORESTATION. 1955 Proc. Soc. Am. For. Meeting. p. 125-128. 1956.

Provides figures and examples to illustrate a number of points. Heavy burning does not eliminate small mammals, but merely reduces their populations--by about 50% in some studies. Various species of rodents usually are present on an area; control is often complex. Forests in different stages of development suffer varying types of damage, from seed-eating by Peromyscus in bare areas, through eating of seedlings by microtines, to porcupine damage of mature trees. Population fluctuations may be extreme; they complicate planning and control. Seasonal fluctuations in numbers, and hibernation by some rodent groups, also complicate management work and must be taken into account. Decimated populations recover much more rapidly than would be desired. This happens partly because of reinvasion, partly because reduced populations breed faster than others. For these reasons, reductional control on a small area is unsatisfactory. A solution would be a "permanent bait," but no such bait has been found. The best answer at present is to treat seeds with a protecting chemical. The problem of protecting young plants for long periods is difficult; a systemic repellent that can be applied to soil and slowly picked up by plant is being sought.

Tevis, Lloyd, Jr. (Box 308, Rancho Mirage, Calif.) RESPONSES OF SMALL MAMMAL POPULATIONS TO LOGGING OF DOUGLAS-FIR. J. Mamm. 37(2): 189-195. May 1956.

Eleven cutovers and the adjacent virgin forest were kill-trapped by a standardized procedure. Peromyscus maniculatus comprised 72% of the catch. Forest catches were consistent with each other, and lower than cutover catches. Within 3 months after timber is felled and slash burned, the number of mice is approximately equal to that in uncut forest. In first summer, when weedy vegetation covers much of ground, the population begins to grow and within 2 or 3 years, as the cutover passes into the weed-brush stage, there is an eruption of mice. From the 4th to 10th years, the mice are 3-4 times more numerous than in the forest. Afterwards, they steadily decline to the original level. Food habits and behavior of the mice is discussed in relation to Douglas-fir seed protection. Ecology and behavior of Eutamias townsendii is also discussed in relation to logging and reseeding. Notes are included on the other small mammals of the area. Of all small mammals studied, logging caused increase of 8 species and decrease of 4.--L. F. Stickel.

Webb, William L., and Earl F. Patric. (State U. of N. Y. Coll. For., Syracuse.) SEED-SOURCE PLANTINGS FOR HABITAT IMPROVEMENT IN NORTHEASTERN FORESTS. Proc. NE. Sections Wildl. Soc. et al., 1956. 1-8 p., proc. May 1956.

More than 50 species were planted in special clearings in the Adirondack Mtns. near Newcomb, N. Y. in search of relatively low-growing woody plants that could spread and improve forest for game. This paper reports results for each species tested. Most species failed, some because of deer damage. Only Japanese barberry was able to do well enough to fruit heavily. It was not browsed by deer; it may have value in grouse management. Crabapple and European mtn.ash probably would have succeeded if not eaten so heavily by deer. "With our present knowledge we cannot recommend seed-source plantings as a practical forest wildlife management technique. However the search should be continued to find woody plant species which can be used for this kind of wildlife habitat improvement."

STRIPPED LAND & MISCELLANEOUS HABITATS

Bell, Roger. (S. Ill. U.) AQUATIC AND MARGINAL VEGETATION OF STRIP MINE WATERS IN SOUTHERN ILLINOIS. Ill. Acad. Sci. Trans. 48: 85-91. 1956.
Provides good information on effects on plant species of: pH, changing water levels, salinity, dissolved oxygen, turbidity, age of pool, fertility, and opportunities for plant invasion. Many plants of wildlife value grow well in or around margins of some of the pools. Introduction of Scirpus validus, Zizania aquatica, and Polygonum coccineum is suggested.

Brewer, Richard, and Edward D. Triner. (S. Ill. U.) VEGETATIONAL FEATURES OF SOME STRIP-MINED LAND IN PERRY COUNTY, ILLINOIS. Ill. Acad. Sci. Trans. 48: 73-84, 2 photos. 1956.
Good ecological study of areas stripped for coal 4 to 22 years before.

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Alley, Harold P. (U. Wyo.) CHEMICAL CONTROL OF BIG SAGEBRUSH AND ITS EFFECT UPON PRODUCTION AND UTILIZATION OF NATIVE GRASS SPECIES. Weeds 4(2): 164-173, 4 figs. Apr. 1956.

Carvell, Kenneth L. (W. Va. U.) THE USE OF CHEMICALS IN CONTROLLING FOREST STAND COMPOSITION IN THE DUKE FOREST. J. For. 54(8): 525-530, 3 figs. Aug. 1956.
Study of costs and effectiveness of various methods of killing several species of hardwoods. Frilling with use of Ammate was most effective. This cost little if any more than girdling. Also discussed are such matters of technique as season of treatment, concentration of poison to use, and height of cut.

Coulter, L. L. (Dow Chem. Co., Midland, Mich.) SOME ASPECTS OF RIGHT-OF-WAY BRUSH CONTROL WITH 2,4,5-T AND 2,4-D. Weeds 3(1): 21-27. Jan. 1954.

Elwell, Harry M. (USDA, Guthrie, Okla.) NEW HERBICIDE CONTROLLED OAK BRUSH AND RESULTED IN INCREASED NATIVE GRASS PRODUCTION. Weeds 2(4): 302-303. Oct. 1953.
The low volatile polypropylene glycol butyl ether ester of 2,4,5-T, applied by airplane, was successful in Okla.

Grove, Alvin R. (Pa. State U.) RIGHT-OF-WAYS MANAGEMENT--A GROWING PROBLEM. Va. Wildl. 17(8): 10-11, 1 photo. Aug. 1956.
"It has been estimated that as many as 10,000,000 acres of land, in eastern United States, will eventually be involved in the cleared right-of-ways of various utility companies." After studying a right-of-way in Pa. that had been treated with selective dormant basal spray applied to stumps and sprouts, the author concluded that the method resulted in a dense cover of low-growing shrubs. Comparison with blanket spraying favors selective treatment. "If the appearance of right-of-ways can be improved, if more food for wildlife can be created, if the living plant decreases the fire danger, if there is less erosion, if the natural competition of growing shrubs is as successful, or more so, at no cost to the utilities, in preventing the reinvasion of tree species, then there is little argument as to the sensible choice which should be made."

Leonard, O. A. (U. Calif., Davis.) STUDIES OF FACTORS AFFECTING THE CONTROL OF CHAMISE (ADENOSTOMA FASCICULATUM) WITH HERBICIDES. Weeds 4(3): 241-254, 2 photos. July 1956.

MAMMALS--GENERAL

Irving, Laurence, Hildur Krog, and Mildred Monson. (Arctic Health Res. Center, Anchorage, Alaska.) THE METABOLISM OF SOME ALASKAN ANIMALS IN WINTER AND SUMMER. Physiol. Zool. 28(3): 173-185. July 1955. [From J. Mamm. 37(2).]

Long, Wm. J. THE SPIRIT OF THE WILD. Doubleday & Co., Garden City, N. Y. 1-256 p., chapter-heading sketches. 1956. $4.00.

This book was published from ms. found by the Rev. Dr. Long's daughter after his death. It is a collection of stories about experiences with muskrats, foxes, deer, wolves, moose, porcupines, bears, beavers, and other animals. There are also several chapters on observations of animal psychology and behavior. All of these are rather interesting reading to almost anyone who likes animals and the out-of-doors. Wildlife biologists, however, will question the accuracy of many observations and the basic philosophy involved. For example, one gets the impression that Long, with no scientific evidence, attributes scarcity of game to abundance of foxes. Furthermore, many interpretations of animal behavior savor strongly of anthropomorphism. Undoubtedly, however, many people will enjoy reading this book. It is, we believe, written primarily for pleasure and can hardly be recommended as serious reading for the student of animal behavior.--Fred H. Dale.

MAMMALS--FAUNAS AND MANUALS

Chermock, Ralph L. (Box 1927, University, Ala.) A KEY TO THE MAMMALS OF ALABAMA. Revised ed. Dept. Biol., U. Ala. 13 p., mimeo. Aug. 1956.

Dichotomous key to all groups, including ssp. Ranges in state are indicated briefly. Use of key depends on having skull, skin, and prior knowledge of characters mentioned. It is interesting to note that Ala. distribution of puma is considered to be statewide.

Hoffmeister, Donald F. (U. Ill.) MAMMALS OF THE GRAHAM (PINALENO) MOUNTAINS, ARIZONA. Am. Midl. Nat. 55(2): 257-288, 7 figs. Apr. 1956.

Annotated list with comments on taxonomy and/or natural history.

Holdenried, R., and Harvey B. Morlan. (Communicable Disease Center, U. S. Pub. Health Serv., Atlanta, Ga.) A FIELD STUDY OF WILD MAMMALS AND FLEAS OF SANTA FE COUNTY, NEW MEXICO. Am. Midl. Nat. 55(2): 369-381, map. Apr. 1956.

From summary: "From July 1951 to February 4, 1954, a total of 8,784 mammals of 34 species were examined. Over 26,000 fleas of 54 species were collected. For each species of mammal, observations are given on reproduction, local distribution, and general abundance of the most frequently collected species of fleas."

Lechleitner, R. R. MAMMALS OF GLACIER NATIONAL PARK. Glacier Nat. Hist. Assn. (West Glacier, Mont.) Bul. no. 6. 92 p., illus. Aug. 1955. $1.00. [From review by F. M. P., Natl. Parks Mag. 29(123).]

"Mr. Lechleitner...is exceptionally talented at presenting solid scientific facts in a pleasant, interesting style... Each account describes the species, and tells how to distinguish it from similar forms; presents a concise but comprehensive life history, and analyzes its status and occurrence in the park..."

Miller, Richard S. (Exp. Sta., Colo. A & M Coll.) A SURVEY OF THE MAMMALS OF BYLOT ISLAND, NORTHWEST TERRITORIES. Arctic 8(3): 166-176, 3 figs. 1955 [1956].

Report of certain studies made on the trip described by Scherman (see p. 9, this issue of WR). The paper is an annotated list of 17 species of land and marine mammals. It gives data on abundance, seasonal distribution, etc. Table and graph show catch of arctic fox, 1921-54, with lesser amounts of data on lemming abundance. Cycle averaging 4 years seems evident in fox. Ringed seal is important to Eskimo and some 11,000 are killed locally each year. Its chief food is a large gammarid. The common lemming is Dicrostonyx. Its population had been at a peak the year before and lemming work was abundant. Although the lemmings had just crashed, their food supply seemed unimpaired and food shortage scarcely could have caused the crash. Lemming migrations are not known in the area. Caribou were exterminated by Eskimo in 1943 and wolves then disappeared. Bowhead whales, once common, are now scarce in the vicinity. Arrival dates of bearded seal and narwhal are correlated with dates of ice break-up, 1946-1954.

Russell, Robert J., and Sydney Anderson. (U. Kans.) SMALL MAMMALS FROM SILVER BOW COUNTY, MONTANA. Murrelet 37(1): 2-3. Jan.-Apr. 1956.
Records for 7 species with notes on taxonomy or variation of 5 of them.

Shippee, E. Allen. (Ecol. Res., Dugway Proving Ground, Utah.) MAMMAL DISTRIBUTION IN RELATION TO DISEASE. In Symposium on ecology of disease transmission in native animals. Ecol. Res., U. of Utah, Dugway Proving Ground, Utah. p. 33-43, 8 figs. Apr. 1955.
Habitats and relative abundance of mammals of the Dugway study area.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Calhoun, John B., editor. 1951 ANNUAL REPORT - NORTH AMERICAN CENSUS OF SMALL MAMMALS. Population Dynamics of Vertebrates, Compilations of Research Data, Release no. 5. (Admin. Publ. US Dept. Health, Educ., & Welfare. Natl. Inst. Mental Health, Bethesda 14, Md.) ii + 164 p. Jan. 1956. [Prepared in small quantities for cooperators. Not available for general distribution.]
The bulk of this paper consists of detailed reports of kill-trap catches of small mammals made by the various cooperators in 1951. In addition, the purposes of the census and methods of sampling are described. An evaluation study being made by Daniel Brant is described briefly.

Christian, John J. (Naval Med. Res. Inst., Bethesda, Md.) ADRENAL AND REPRODUCTIVE RESPONSES TO POPULATION SIZE IN MICE FROM FREELY GROWING POPULATIONS. Ecol. 37(2): 258-273, 9 figs. Apr. 1956.
Summary: "Experimental populations of house mice...were allowed to develop from a few pairs in large cages with food, water, cover, and nesting material in excess. Four populations were allowed to grow until population growth approached zero. Two populations were terminated at an estimated one-half maximum size. There was a steady decline in infant survival and birthrate with increasing population size until both approached zero. The adrenal weights of males from the high populations averaged 25% greater than their pair-isolated controls, while those from intermediate populations averaged 12% greater. The female adrenals from high populations were 7% greater than their controls for all body weights, and 14% greater if only females weighing more than 16 grams were considered. The adrenals of female mice from the intermediate populations averaged 7% greater than their controls... The productivity of the experimental female mice was reduced at least 31% from the control level, as determined by autopsy examination. These results coincide with those from experiments with populations of fixed size, and were interpreted as follows: with increasing population density there are increasing levels of stress which are reflected by adrenocortical hypertrophy and reproductive suppression in both sexes of mice." Histological and endocrine correlations are described.

Christian, John J., and David E. Davis. (Naval Med. Res. Inst., Bethesda 14, Md.) THE RELATIONSHIP BETWEEN ADRENAL WEIGHT AND POPULATION STATUS OF URBAN NORWAY RATS. Naval Med. Res. Inst., Res. Rep. vol. 14: 173-184, 3 figs. Feb. 1956. [Will be published later in J. Mamm.]
Adrenal weights were obtained from rats of 49 samples of 21 populations in Baltimore, Md. Adrenal weights were lowest in low increasing populations and increased regularly at about 6% per stage through high increasing, high stationary, and decreasing populations. Adrenal values from decreasing populations av. 18% greater than those from low increasing populations. Adrenals of males were highest in low stationary populations, while those of females av. about the same as in low increasing populations. Significance of this is not clear. Adrenal values did not vary with season. There was a positive relationship between relative weights of pituitary and adrenal glands in males. There was no significant variation with population status or adrenal weight in pituitary weights of females or the thyroids of either sex. A non-significant decline in thymus weight in females occurred with increasing adrenal weight. It was concluded that there was a density-dependent stimulus to the pituitary-adreno-cortical system that operated independently of season or supplies of the usual environmental necessities.

Vest, Dean. (Ecol. Res., Dugway Proving Ground, Utah.) AN EXPLORATORY STUDY OF QUANTITATIVE METHODS OF TRAPPING RODENTS. In Symposium on ecology of disease transmission in native animals. Ecol. Res., U. of Utah, Dugway Proving Ground, Utah. p. 16-19, 3 graphs. Apr. 1955.

Quadrats 60 m. per side were live trapped with trap spacings of 20, 32.8, and 50 ft. A quadrat with 50 ft. spacing was trapped with 2 traps per site. The 32.8 ft. spacing was at least as effective as the 20 ft., as judged by size of catch, although there were only 49 traps as opposed to 121. The 32.8 ft. spacing caught about 2.5 times as many animals as the 50 ft., probably owing to difference between 49 and 25 traps. Catch increased with 50 ft. spacing when there were 2 traps per site, but was still less than that with 32.8 ft. spacing and 1 trap per site.

MAMMALS--PARASITES AND DISEASES

Anon. RABIES IN THE UNITED STATES IN 1955. J. Am. Vet. Med. Assn. 129(3): 97, 1 map. Aug. 1, 1956.

Summary of incidence of reported cases. Tabulation by species and states.

Fay, L. D. (Mich. Dept. Cons.) FACTS, FANCIES AND RABIES. Mich. Cons. 25(4): 29-31, 1 photo. July-Aug. 1956.

This general article states that although rabies incidence is fairly high among domestic animals in Mich., rabies does not occur there in foxes. The wild animal most often found rabid in Mich. is striped skunk, and only 2 to 5 rabid skunks are found in a year.

Grundmann, Albert W. (U. Utah.) A NEW TAPEWORM, MESOCESTOIDES CARNIVORICOLUS, FROM CARNIVORES OF THE GREAT SALT LAKE DESERT REGION OF UTAH. Proc. Helminth. Soc. Wash. 23(1): 26-28, 3 figs. Jan. 1956.

Adults in coyote, badger, and bobcat. Tetrathyridia in Peromyscus.

Karstad, L. H., E. V. Adams, R. P. Hanson, and D. H. Ferris. (U. Wis.) EVIDENCE FOR THE ROLE OF WILDLIFE IN EPIZOOTICS OF VESICULAR STOMATITIS. J. Am. Vet. Med. Assn. 129(3): 95-96. Aug. 1, 1956.

Summary: "In a serological sampling of wildlife populations in southeastern Georgia, 72 of the 118 raccoon, deer, and feral swine collected yielded significantly high titers of neutralizing antibody against New Jersey-type vesicular stomatitis virus. A few of the possible implications of these observations are pointed out. Further investigations are indicated."

Swink, F. Nelson, Jr. (Va. Comm. Game.) RABIES AND WILDLIFE. Va. Wildl. 17(7): 5-7, 3 photos. July 1956.

Good general article on rabies in Va., where the disease is now spread mainly by foxes. In 1955, rabies was reported twice as often in wild animals as in dogs. The incubation period is long and variable; in foxes it may av. 3-5 months. In Va. this would mean that most transmission occurs in autumn, when fox populations are highest and young are dispersing. Foxes, at least reds, are decreasing in numbers over most of Va. A table shows numbers of cases of rabies reported in Va. for all animals combined and for foxes, 1938-55.

SHREWS, MOLES, BATS

Burns, K. F., C. F. Farinacci, T. G. Murnane, and Dorothy F. Shelton. (Brooke Army Med. Center, Ft. Sam Houston, Tex.) INSECTIVOROUS BATS NATURALLY INFECTED WITH RABIES IN SOUTHWESTERN UNITED STATES. Am. J. Pub. Health 46(9): 1089-1097. Sept. 1956.

Summary: "Two species of colonial insectivorous bats (T. brasiliensis cynocephala and M. velifer incautus) collected in Louisiana and Texas, respectively, are the first to be reported from these states as being naturally infected with rabies. In addition, two species of free-living insectivorous bats (L. borealis borealis and A. pallidus pallidus) collected in Texas were reported to be naturally infected with rabies. Further evidence of latent and asymptomatic carriers of the virus of rabies in insectivorous bats in the states of Texas, Louisiana, and New Mexico is presented. Serums of apparently

normal healthy bats representing fauna collected over an extensive geographical area revealed the presence of neutralizing antibodies for the virus of rabies in a large percentage of specimens. An extremely high percentage of bat brain tissues from which rabies virus was isolated were negative for Negri bodies. Four strains of a bat salivary gland agent unrelated to rabies and sharing some antigen common to St. Louis encephalitis virus are reported."

Davis, Wayne H., and William Z. Lidicker, Jr. (U. Ill.) WINTER RANGE OF THE RED BAT, LASIURUS BOREALIS. J. Mamm. 37(2): 280-281. May 1956.
Evidence that the red bat can and normally does winter in regions where the temperature frequently drops below freezing. It winters regularly in W. Va. and probably also in Mo., Ill. and Ind.

Eadie, W. Robert, and W. J. Hamilton, Jr. (Cornell U.) NOTES ON REPRODUCTION IN THE STAR-NOSED MOLE. J. Mamm. 37(2): 223-231, graph. May 1956.
Data collected by the authors over a period of years and review of literature. Evidence points toward a single litter a year. Breeding season, litter size, appearance and growth of young, and age at first breeding are discussed. Some evidence is given that the enlarged tail represents food stored for the breeding season.

Mann, Peter M. (Ont. Vet. Coll., Guelph.) KEEPING SHORT-TAILED SHREWS IN CAPTIVITY. J. Mamm. 37(2): 274-275. May 1956.
Shrews fed entirely on canned dog food were kept in good condition. Reproduction is not mentioned.

Parke, Wesley W. (U. Conn.) BRONCHIAL DIVERTICULA IN BLARINA BREVICAUDA. J. Mamm. 37(2): 236-245, 1 fig. May 1956.
In a series of 106 specimens, geographically distributed, the diverticula were found in all but a single representative of a peninsular subspecies. These structures and their proximal bronchi possess a unique musculature and are believed to be capable of peristaltically expelling their contents, and then may assist in the collection and elimination of foreign matter aspired into the right stem bronchus.

Schroeder, C. R. THE ROLE OF BATS IN THE TRANSMISSION OF RABIES. Essays in the Natural Sciences in Honor of Captain Allen Hancock. Univ. S. Calif., Los Angeles. p. 221-232, illus. July 1955. [From J. Mamm. 37(2).]

Stamm, D. D., R. E. Kissling, and M. E. Eidson. (P. O. Box 61, Montgomery, Ala.) EXPERIMENTAL RABIES INFECTION IN INSECTIVOROUS BATS. J. Infectious Dis. 98(1): 10-14. Jan.-Feb. 1956.

RABBITS AND PIKAS

Besser, Jerome, and Jack F. Welch. STUDIES WITH REPELLENTS FOR PROTECTION OF HARDWOODS AND CONIFERS FROM DAMAGE BY RABBITS AND HARES (1955-56). Spec. Rep., US F&WS, Denver 2, Colo. 1-15 p., mimeo. July 1956.
Latest findings from tests by F&WS and others. States sources and costs of materials and presents data in several tables. From summary: "Three repellents, TN-2500, ZAC, and TMTD at concentrations of 10 percent reduced damage by cottontails, jackrabbits, and varying hares to coniferous forest seedlings, and hardwood game-cover and shelterbelt species by 64-100 percent in field tests conducted in 1955-56... No phytotoxicity was observed with any of the treatments applied to dormant hardwood species. Young coniferous seedlings were more difficult to protect... The 10 percent TN-2500 treatment, although slightly more repellent to hares, caused a 35 percent mortality to Douglas-fir seedlings, and delayed emergence of terminal buds of red and white pine... The value of retreating seedlings the second dormant season after planting to protect the current season's growth was indicated... Enclosure tests in Ontario, Canada, indicated these treatments were repellent to European hares. The weather resistance of the 10 percent TN-2500 film was outstanding..." Adhesive used in all tests was Rhoplex AC-33.

Burbutis, Paul P., and Robert E. Mangold. (Rutgers U., New Brunswick.) A STUDY OF THE FLEAS OF COTTONTAIL RABBITS IN NEW JERSEY. J. Wildl. Mgt. 20(2): 217-218. Apr. 1956.

Between 1950 and 1954, 311 cottontails were found with 2071 fleas including Cediopsylla simplex (88.41%), Odontopsyllus multispinosus (6.76%), Ctenophthalmus pseudagyrtes, Epitedia wenmanni, Cediopsylla inaequalis inaequalis, and Hoplopsyllus affinis.--Authors.

Fenner, Frank. (Aust. Natl. U., Canberra.) MYXOMATOSIS: THE VIRUS AND THE DISEASE IT CAUSES. Aust. J. Sci. 15(3): 81-85, 1 fig. Dec. 1952.

Fenner, Frank, M. F. Day, and Gwendolyn M. Woodroofe. (Aust. Natl. U., Canberra.) THE MECHANISM OF THE TRANSMISSION OF MYXOMATOSIS IN THE EUROPEAN RABBIT (ORYCTOLAGUS CUNICULUS) BY THE MOSQUITO AEDES AEGYPTI. Aust. J. Exp. Biol. & Med. Sci. 30: 139-152. 1952.

Fenner, Frank, and I. D. Marshall. (Aust. Natl. U., Canberra.) PASSIVE IMMUNITY IN MYXOMATOSIS OF THE EUROPEAN RABBIT (ORYCTOLAGUS CUNICULUS): THE PROTECTION CONFERRED ON KITTENS BORN BY IMMUNE DOES. J. Hygiene 52(3): 321-336, 1 fig. Sept. 1954.

Fenner, Frank, I. D. Marshall, and Gwendolyn M. Woodroofe. (Aust. Natl. U., Canberra.) STUDIES IN THE EPIDEMIOLOGY OF INFECTIOUS MYXOMATOSIS OF RABBITS. I. RECOVERY OF AUSTRALIAN WILD RABBITS (ORYCTOLAGUS CUNICULUS) FROM MYXOMATOSIS UNDER FIELD CONDITIONS. J. Hygiene 51(2): 225-244, 3 figs. June 1953.

Fenner, F., and Gwendolyn M. Woodroofe. (Aust. Natl. U., Canberra.) THE PATHOGENESIS OF INFECTIOUS MYXOMATOSIS: THE MECHANISM OF INFECTION AND THE IMMUNOLOGICAL RESPONSE IN THE EUROPEAN RABBIT (ORYCTOLAGUS CUNICULUS). Brit. J. Exp. Pathol. 34(4): 400-411, 3 figs. Aug. 1953.

Kirkpatrick, Charles M. (Purdue U.) COPROPHAGY IN THE COTTONTAIL. J. Mamm. 37(2): 300. May 1956.

A wild, unconfined individual was seen to take pellets from the anus into the mouth.

Marshall, I. D., A. L. Dyce, W. E. Poole, and Frank Fenner. (Aust. Natl. U., Canberra.) STUDIES IN THE EPIDEMIOLOGY OF INFECTIOUS MYXOMATOSIS OF RABBITS. IV. OBSERVATIONS OF DISEASE BEHAVIOUR IN TWO LOCALITIES NEAR THE NORTHERN LIMIT OF RABBIT INFESTATION IN AUSTRALIA, MAY 1952 TO APRIL 1953. J. Hygiene 53(1): 12-25, 2 figs. Mar. 1955.

Myers, K., I. D. Marshall, and Frank Fenner. (CSIRO, Wildl. Surv. Sec., Field Sta., Albury, N. S. W.) STUDIES IN THE EPIDEMIOLOGY OF INFECTIOUS MYXOMATOSIS OF RABBITS. III. OBSERVATIONS ON TWO SUCCEEDING EPIZOOTICS IN AUSTRALIAN WILD RABBITS ON THE RIVERINE PLAIN OF SOUTHEASTERN AUSTRALIA 1951-1953. J. Hygiene 52(3): 337-360, 4 figs., 2 pls. Sept. 1954.

Mykytowycz, R. (Wildl. Surv. Section, C.S.I.R.O., Canberra, Aust.) THE EFFECT OF SEASON AND MODE OF TRANSMISSION ON THE SEVERITY OF MYXOMATOSIS DUE TO AN ATTENUATED STRAIN OF THE VIRUS. Aust. J. Exp. Biol. & Med. Sci. 34: 121-132, 1 graph. 1956.

PROCEEDINGS OF SYMPOSIUM ON "MYXOMATOSIS." J. Aust. Inst. Agr. Sci. vol. 21, nos. 3 & 4: 130-151 and 250-255, illus. Sept. & Dec. 1955.

Six papers published in 2 issues are combined in reprint. Contents are: Review of myxomatosis in Australia, 1950-1955, by F. N. Ratcliffe. Changes in the innate resistance of rabbits to myxomatosis, by W. R. Sobey. Changes in the virulence of myxoma virus associated with its natural transmission in populations of the rabbit, Oryctolagus cuniculus, by Frank Fenner. Factors influencing the transmissibility of myxoma virus by mosquitoes, by M. F. Day. The ecology of the mosquito vectors of myxomatosis (Culex annulirostris Skuse and Anopheles annulipes Walk.) in the eastern Riverina, by K. Myers. Bibliography of publications concerning myxomatosis in Australia.

Ratcliffe, F. N. (CSIRO, Wildl. Surv. Sec., Canberra, Aust.) THE ECOLOGICAL CONSEQUENCES OF MYXOMATOSIS IN AUSTRALIA. Presented at Internat. Union Prot. Nature, 6th Tech. Meeting. 12 p., mimeo. 1956.

Rohrbacher, G. H., Jr. and F. A. Ehrenford. (U. Calif., Berkeley.) BIOGASTRANEMA NEW GENUS (NEMATODA: TRICHOSTRONGYLIDAE) FROM THE CALIFORNIA JACKRABBIT, LEPUS CALIFORNICUS CALIFORNICUS GRAY (MAMMALIA: LEPORIDAE). Proc. Helminth. Soc. Wash. 21(2): 63-67, 8 figs. July 1954.

Rowan, Wm., and L. B. Keith. (U. Alberta, Edmonton.) REPRODUCTIVE POTENTIAL AND SEX RATIOS OF SNOWSHOE HARES IN NORTHERN ALBERTA. Can. J. Zool. 34(4): 273-281, 2 graphs. Aug. 1956.

Abstract: "In conjunction with studies of the '10-year cycle' of snowshoe hares, almost 900 hares were collected in the Anzac district of Alberta during the period May, 1949, to April, 1956. Embryo numbers and sex ratios were among the data gathered from post-mortem examination of these hares. It was found that the average litter size was 3.82; the modal litter size was four and the range was from one to seven. The average number of litters each season was calculated at 2.75. The annual reproductive potential is thus 10.51 (3.82 x 2.75) young per female hare. This is more than 50% greater than that indicated by comparable data from Minnesota. It is suggested that herein lies the cause of higher peak populations in northern regions. Sex ratios shifted from a marked excess of females in the year 1949-1950 to about even numbers of both sexes during the two subsequent years. Since the change in sex ratio occurred at the peak of the cycle, the two factors are believed to be in some manner correlated."

Rudasill, L. S. (Md. Game Comm.) AN EXPERIMENT WITH THE SAN JUAN RABBIT. Md. Cons. 33(5): 8-9. Sept. 1956.

A half-acre pen was built on a site that had a good variety of woody and herbaceous plants. For 1 year, a ♂ and 2 ♀ Oryctolagus were kept in the pen, with replacements added as rabbits died. Foods eaten most heavily were clovers, locust sprouts and roots, apple and wild cherry bark, and honeysuckle. Much digging was done; the chief burrow was 16 ft. long and 2 ft. below surface. Two litters were born but died or were abandoned. Two adult ♀♀ and 1 adult ♂ died during the year. "Due to the damaging burrowing habits, failure to successfully reproduce, and complete nocturnal nature of the San Juan rabbit, the author's opinion is that nothing can be gained by introducing this species in the State of Maryland."

Schwartz, Albert. (Charleston Mus., Charleston 16, S. C.) THE COTTONTAIL RABBITS (SYLVILAGUS FLORIDANUS) OF PENINSULAR FLORIDA. Proc. Biol. Soc. Wash. 145-151. Sept. 1956.

Description of new ssp. from se. Fla. and good data on characteristics and ranges of the other 3 ssp. in the state.

Sheffer, Dale E. (Md. Game Comm.) RABBIT STOCKING EXPERIMENTS. Md. Cons. 33(4): 26-27, 2 photos. July 1956.

Md. has experimented for some time with artificial propagation of cottontails for stocking. [See, for example, WR 81: 23 and WR 85: 24.] Here is a report on a field test of these rabbits. Two-hundred cottontails were taken from the pens, tagged, and released in 6 counties on farms open to hunting. Only 3 of the 200 were reported as bagged. Twenty others were tagged and released on 1 farm 10 days before hunting season. The farm was checked thoroughly for a week. Three tagged rabbits were found dead but not 1 was bagged during the week. One was reported as shot later in the season. Thus 4 of 220 were known to have been bagged. Some of the others may be alive, but "It is very doubtful in the writer's opinion that these releases will contribute toward better hunting next fall on those farms because of the few tag recoveries of rabbits released just prior to the hunting season. This experiment, though small, proves out what past experiments in other States have shown. Good combinations of food and low-growing ground cover for winter use will prove most effective in maintaining and in building up cottontail numbers."

Southern, H. N. (Bur. Anim. Pop., Oxford U., Eng.) ECOLOGISTS ARE EXCITED BY ENGLAND'S "RABBIT DISEASE." Anim. Kingdom 59(4): 116-123, 6 photos. July-Aug. 1956.

Interesting narrative account of ramifications of British myxomatosis epizootic as shown by author's studies. Southern shows what a pest the rabbit was and includes good photos of an elm plantation barked as high as rabbits could reach, a barley field completely mowed by rabbits, the same field in full fruit after the epizootic, and a sandy pasture made useless by rabbit digging and eating. These photos should be useful in showing what the same "San Juan" rabbit could do in U. S. Southern was making a quantitative field study of the prey-predator relationships of tawny owl with wood mouse and bank vole when the epizootic virtually eliminated rabbits. Predators first feasted on dead rabbits then turned to other prey, especially Southern's mice and voles. Populations of these rodents dropped sharply. Tawny owls, in consequence, almost ceased breeding. Foxes continued to flourish, partly at the expense of poultry. Stoats and weasels apparently suffered and decreased in numbers. All this happened in late 1954 and early 1955. A year later the mouse and vole populations had recovered; an unusually high percentage of tawny owls began breeding. Ecologists are waiting to see whether violent and continuing population oscillations have set going "or whether the lateral cross-connections between the consumer layers in an animal community can buffer and depress such oscillations, even when so large a spanner as myxomatosis has been thrown into their works."

Spencer, John L. (Fed. Exp. Sta., Mayagüez, P. R.) REINGESTION IN THREE AMERICAN SPECIES OF LAGOMORPHS. Lloydia 18(4): 197-199. Dec. 1955.

"These three species of American Leporinae: L. townsendii campanius, L. americanus virginianus, and S. transitionalis, have a diurnal rhythm concerned with the reingestion of a special, amorphous feces that is well defined and apparently similar to the coprophagy reported for two European lagomorphs."

RODENTS--MISCELLANEOUS

Anderson, Sydney. SUBSPECIATION IN THE MEADOW MOUSE, MICROTUS PENNSYLVANICUS, IN WYOMING, COLORADO, AND ADJACENT AREAS. U. Kans. Publ., Mus. Nat. Hist., 9(4): 85-104, 2 maps. May 1956.

Eight subspecies, 3 of them new, are recognized in the region. The races are described and their ranges are mapped.

Durham, Floyd E. VARIATIONS AND ADAPTATIONS OF THE RODENTS OF THE NORTH RIM OF THE GRAND CANYON, ARIZONA. Essays in the Natural Sciences in Honor of Captain Allen Hancock. Univ. S. Calif., Los Angeles. p. 233-258, 2 maps. July 1955. [From J. Mamm. 37(2).]

Ecke, Dean H., and Alva R. Kinney. (Santa Clara Co. Health Dept., San Jose, Calif.) AGING MEADOW MICE, MICROTUS CALIFORNICUS, BY OBSERVATION OF MOLT PROGRESSION. J. Mamm. 37(2): 249-254, 1 fig. May 1956.

Flat-skin mounts of 33 specimens of known age showed a close age-molt correlation from 17th to 60th day of age. Animals could be aged to within 4 days of absolute age. The method was 88% accurate with laboratory reared mice.

Edwards, R. Y. (B. C. For. Serv., Victoria.) THE HABITAT PREFERENCES OF THE BOREAL PHENACOMYS. Murrelet 36(3): 35-38. Sept.-Dec. 1955[May 1956].

Summary: "Thirty-nine literature descriptions of habitat in which the vole Phenacomys (P. ungava and P. intermedius) has been taken, and the habitat of 54 Phenacomys taken in British Columbia suggest that this mammal prefers open, seral forest vegetation in dry sites. Such sites near surface water seem to be superior. Lodgepole pine is usually associated with this mouse in British Columbia. Grasses may further denote superior habitat. There is some indication that brush heaps provide preferred cover."

Egoscue, Harold J. (Ecol. Res., Dugway Proving Ground, Utah.) THE FAUNAL COLONY AS A RESERVOIR OF NATIVE ANIMALS. In Symposium on ecology of disease transmission in native animals. Ecol. Res., U. of Utah, Dugway Proving Ground, Utah. p. 50-54, 1 photo. Apr. 1955.

How to rear successfully in the laboratory Peromyscus maniculatus, Neotoma lepida, Reithrodontomys megalotis, and Onychomys leucogaster.

Fitch, Henry S., and Dennis G. Rainey. (U. Kans.) ECOLOGICAL OBSERVATIONS ON THE WOODRAT, NEOTOMA FLORIDANA. U. Kans. Publ., Mus. Nat. Hist., 8(9): 499-533, 3 figs. June 1956.

Studies on and near the U. Kans. Nat. Hist. Reservation produced much good information on habitat, reduction of population (apparently by weather, in part), natural enemies, animal associates, movements (home ranges quite small for so large an animal), high degree of intraspecific intolerance, foods, breeding, growth, longevity (relatively great).

Garrison, George A., and A. W. Moore. (Pac. NW. For. & Range Exp. Sta., Portland, Ore.) RELATION OF THE DALLES POCKET GOPHER TO ESTABLISHMENT AND MAINTENANCE OF RANGE GRASS PLANTINGS. J. Range Mgt. 9(4): 181-184, 4 figs. July 1956.

From conclusions: "The damage caused by Dalles pocket gophers [Thomomys talpoides quadratus] to range grass plantings and the differences in vulnerability of grasses by age and species were shown by a study in eastern Oregon. Old-drill-row plants in 9- to 11-year old plantings of crested wheatgrass were not greatly affected by current gopher burrowing and feeding. Establishment of natural reproduction between drill rows of this bunchgrass, however, was definitely impaired by gopher activities." Close spacing of drill rows is therefore advisable if pocket gophers are prevalent. "Seedbed preparation, which destroyed all broad-leaved herbs preferred by gophers, rendered new planting sites unattractive to gophers until the new grass stand was developed enough to be a source of gopher food. When unprotected from gophers, new stands of tall oatgrass were the first to be damaged and suffered most. Wheatgrass stands were much less attractive to gophers. Rhizome production of pubescent wheatgrass partially offset gopher damage. The practice of direct gopher control cannot be eliminated for all site conditions and gopher pressures; however, a seedbed free of broad-leaved herbs and planted to rhizomatous wheatgrasses would probably need only moderate control for the first three growing seasons and none after the fifth..." Control costs would be justifiable, considering cost of reseeding.

Greenwald, Gilbert S. (Carnegie Inst. of Wash., Balt., Md.) THE REPRODUCTIVE CYCLE OF THE FIELD MOUSE, MICROTUS CALIFORNICUS. J. Mamm. 37(2): 213-222, 2 figs., 1 pl. May 1956.

Histological study. M. californicus is an induced ovulator, ovulation occurring within 15 hours post coitum. The follicular cycle closely resembles that of other induced ovulators that have been studied. Some wild females have ovulated and have been impregnated when only 2 weeks old.

Hall, E. Raymond. (U. Kans.) A NEW SUBSPECIES OF WOOD RAT FROM NAYARIT, MEXICO, WITH NEW NAME COMBINATIONS FOR THE NEOTOMA MEXICANA GROUP. J. Wash. Acad. Sci. 45(10): 328-332, 1 map. Oct. 1955.

Twenty-five named forms are arrayed as ssp. of N. mexicana. Their ranges are mapped and marginal localities are listed for each. Ranges of 7 of the ssp. extend into w. U. S.

Herter, Konrad, and Gerhard Lauterbach. DIE ÜBERWINTERUNG SYRISCHER GOLDHAMSTER (MESOCRICETUS AURATUS WATERH.) IN NORDDEUTSCHLAND. Z. Säugetierk. 20 (2/3): 37-54, 4 figs. Aug. 1955.

Because of warnings by H. Petzsch, whose papers they cite, the authors experimented with the ability of the hamster to overwinter in North Germany. They found that hamsters could live through a really hard winter when exposed to the full force of the cold in cages in which they could not dig. Under these conditions, hamsters hibernated briefly or not at all. Those allowed to do so dug deep, well-organized burrows and hibernated in them for 4 months. Tendencies for hibernation were variable, perhaps as a result of domestication. Authors conclude that establishment of hamsters in Germany is perfectly possible. [Results suggest that hamsters might become established in almost any part of the U. S. These animals are common in the pet trade; pairs are offered at low prices by the big, general mail-order houses. Releases and escapes in all parts of the country must be expected. Establishment at 2 points in ne. U. S. has been reported; these known colonies, 1 indoors, 1 outdoors, are believed to have been eliminated by control measures (W. W. Dykstra). It is important to remember that hamsters have an exceedingly high reproductive rate, even for small rodents, are deep burrowers, and are great hoarders of food. What other qualities are required for an animal to be rated as a potentially major pest?]

Jollie, Wm. P. (Ecol. Res., Dugway Proving Ground, Utah.) REARING THE PALLID ORD KANGAROO RAT IN THE LABORATORY. In Symposium on ecology of disease transmission in native animals. Ecol. Res., U. of Utah, Dugway Proving Ground, Utah. p. 54-56. Apr. 1955.

Study of reproductive cycle. Rearing in laboratory is not yet feasible.

Marshall, A. J., and O. Wilkinson. (Med. Coll., U. London, Eng.) REPRODUCTION IN THE ORKNEY VOLE (MICROTUS ORCADENSIS), UNDER A SIX-HOUR DAY-LENGTH AND OTHER CONDITIONS. Proc. Zool. Soc. London 126(3): 391-395, 1 pl. May 1956.

Summary: "There is no significant difference between the reproduction rates of laboratory populations...existing under (a) winter day-length (six hours) and (b) London summer day-lengths (fifteen hours to fifteen hours twenty-eight minutes) if abundant food is provided at ordinary summer temperatures. 2. These data, and other considerations discussed, suggest that, as in birds, environmental factors other than photoperiodicity alone, probably govern the sexual cycle of some mammals. 3. A grouped arrangement of interstitial cells essentially similar to that occurring in birds is described. As spermatogenesis proceeds these cells expend their cholesterol-positive lipids as do those of birds. 4. The seminiferous tubules do not undergo a post-nuptial metamorphosis. Even when males are kept alone in total darkness the germ-cells retain their integrity and do not metamorphose as do those of passerine birds under semi-dark conditions."

Martin, Edwin P. (Kans. State Coll., Ft. Hays.) A POPULATION STUDY OF THE PRAIRIE VOLE (MICROTUS OCHROGASTER) IN NORTHEASTERN KANSAS. U. Kans. Publ., Mus. Nat. Hist., 8(6): 361-416, 19 figs. Apr. 1956.

This 23-month study extended through periods of extremely heavy rainfall, drouth, and normal rainfall. The effects of these weather variations on Microtus and on Sigmodon hispidus populations and reproduction are emphasized, as are species interrelationships, competition, and habitat preferences. For Microtus, data are presented on sizes and fluctuations of populations, age and sex ratios, survival, reproduction, weights, growth, methods of age determination, food habits, nesting, and other activity.--L. F. Stickel.

Morejohn, G. Victor, and Walter E. Howard. (U. Calif., Davis.) MOLT IN THE POCKET GOPHER, THOMOMYS BOTTAE. J. Mamm. 37(2): 201-213, 4 figs., 1 pl. May 1956.

Pedersen, Carsten. BESTANDSSVINGNINGER HOS DANSK MARKMUS (Fluctuations in density of Danish meadow mice). Dansk Skovforenings Tidsskrift nr. 9. p. 414-431, 2 graphs. 1955.

In Danish. By careful examination of forestry publications and record books of district foresters, author was able to estimate abundance of meadow mice (Microtus spp.) in years past. A graph shows fluctuations of Microtus, 1910-53.--V. F. Flyger.

Preble, Norman A. (NE. Univ., Boston.) NOTES ON THE LIFE HISTORY OF NAPAEOZAPUS. J. Mamm. 37(2): 196-200. May 1956.

Habitat preferences, altitudinal distribution, reproduction, weights & measurements, times of entrance to and emergence from hibernation in the Presidential Range, White Mtns., N. H.--L. F. Stickel.

Rosasco, M. Edwin. (Ecol. Res., Dugway Proving Ground, Utah.) STUDIES OF POPULATION DYNAMICS OF CERTAIN RODENTS OF THE GREAT SALT LAKE DESERT. In Symposium on ecology of disease transmission in native animals. Ecol. Res., U. of Utah, Dugway Proving Ground, Utah. p. 23-28, 4 graphs. Apr. 1955.

An 80-acre study area was live trapped with 5 trap lines for a year. Only 1 of the lines was trapped at a time. Trapping averaged about 8.5 nights per month. Catches and travels are recorded for Peromyscus maniculatus and Dipodomys ordii. 95% of recorded movements of Peromyscus were of less than 450 ft. 95% of recorded movements of Dipodomys were of less than 250 ft. There seemed to be an inverse relationship between population density and degree of movement. Peromyscus breeding peaks were in spring and fall. The fall period was about 3 times as important in increasing population. Dipodomys seemed to be in breeding condition from Jan. to Aug., with peak in Apr.

RODENTS--MISCELLANEOUS--Continued

Sillman, E. I. (Ont. Agr. Coll., Guelph.) STUDIES ON THE BIOLOGY OF A CUTEREBRID (CUTEREBRIDAE: DIPTERA) INFESTING PEROMYSCUS LEUCOPUS NOVEBORACENSIS, FISCHER, THE WHITE-FOOTED MOUSE, IN SOUTHERN ONTARIO. Ann. Rep. Ent. Soc. Ont. 86: 89-97, 3 figs. 1955[1956].

Smith, Donald A., and Kenneth C. Fisher. (U. Toronto, Ont.) THE DISTRIBUTION, ORIENTATION, AND ACTIVITIES OF THE VARYING LEMMING IN A GRADIENT OF TEMPERATURE. Can. J. Zool. 34(4): 243-261, 6 figs. Aug. 1956.
Laboratory study of Dicrostonyx groenlandicus.

Tevis, Lloyd, Jr. (U. Calif., Davis.) POCKET GOPHERS AND SEEDLINGS OF RED FIR. Ecol. 37(2): 379-381. Apr. 1956.
A mtn. prairie in nw. Calif. was heavily overgrazed by livestock. Thomomys monticola consequently increased and contributed to deterioration of range. The large amounts of raw ground provided ideal seed bed when red fir had bumper seed crop in 1951. Enormous numbers of seedlings appeared, but after 2 years they were abundant only where gophers did not work. Gophers ate them, buried them, or exposed their roots to drying. Enough survived to show that much of the range is destined to become forest. A reversal of this trend will require reduction of both livestock and gophers and seeding of bare areas with grass.

Wellwood, A. A. SOME FOOD PREFERENCES IN FIELD MICE. (Ont. Agr. Coll., Guelph.) J. Mamm. 37(2): 297-298. May 1956.
Grain preference of a pair of Microtus pennsylvanicus kept in the laboratory was: wheat, corn, oats, barley, pumpkin seeds, in that order. Great preference for white grubs was shown over all other food.

Zimmermann, Klaus. KÖRPERGRÖSSE UND BESTANDSDICHTE BEI FELDMÄUSEN (MICROTUS ARVALIS). Z. Säugetierk. 20(2/3): 114-118. Aug. 1955. [From J. Mamm. 37(2).]

RATTUS AND MUS

Beach, Frank A., and Julian Jaynes. (Yale U.) STUDIES OF MATERNAL RETRIEVING IN RATS. I: RECOGNITION OF YOUNG. J. Mamm. 37(2): 177-180, graph. May 1956.
Laboratory rats (Rattus norvegicus) retrieved their own young more rapidly than alien young. Surgical elimination of cutaneous sensitivity in snout and lips did not destroy the discriminatory behavior, but removal of the olfactory bulbs totally eliminated differential responsiveness, and alien young were accepted as readily as the female's own offspring.--L. F. Stickel.

Calhoun, John B. (Natl. Inst. Mental Health, Bethesda 14, Md.) BEHAVIOR OF HOUSE MICE WITH REFERENCE TO FIXED POINTS OF ORIENTATION. Ecol. 37(2): 287-301, 6 figs. Apr. 1956.
Colonies of various strains of house mice were established in small indoor pens. Supplies of food, water, and nesting material were available only at one point per pen. Ramps led to tiers of shelves on which nest boxes were placed at increasing distances from ramps. Some shelves had no boxes. Activities were studied by direct observation and by numbers of droppings deposited at different points. Some of the findings were: Mice seldom stopped in open areas; they tended to move along and pause near objects. Distant objects were less often used than handier ones; this was more true of purposeful than of exploratory behavior. Mice tended to pause at ends of shelves that had no boxes. When mice were highly motivated they selected the shortest route to a goal. When mice were not highly motivated their routes were determined primarily by the probability of encountering the origin of the route. The experimental set-up was more complicated than described here and many observations not mentioned here are discussed in the paper.

Caslick, James W. (US F&WS, Gainesville, Fla.) COLOR PHASES OF THE ROOF RAT, RATTUS RATTUS. J. Mamm. 37(2): 255-257. May 1956.
"Evidence in the form of breeding results is presented to support the view that the currently recognized subspecies of Rattus rattus are only color phases and do not fulfill the requirements for subspecific status."

Davis, David E. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) THE FREQUENCY OF REDUCTION OF RAT POPULATIONS BY WEATHER. Ecol. 37(2): 385-387. Apr. 1956.

Summary: "The frequency of action of weather on rat (Rattus norvegicus) populations is considered. The numbers of rats in various blocks declined drastically in the summer of 1955 and returned to their former level by November. This change coincided with a drouth in July and a heavy rain in August. The frequency of such conditions is 3 and 1, respectively, in the 139 years of weather records for Baltimore. From these frequencies it is concluded that summer weather is sufficiently severe to reduce rat populations about 2-5 times in 100 years."

Davis, D. E., and John T. Emlen. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) DIFFERENTIAL TRAPABILITY OF RATS ACCORDING TO SIZE AND SEX. J. Wildl. Mgt. 20 (3): 326-327. July 1956.

Data on 2,469 Norway rats caught in 20 city blocks in Baltimore showed that in the first third of the trapping period large rats were markedly more trapable than small rats in exhaustive trapping campaigns of about 2 weeks duration. These observations suggest that conclusions about size composition results based on small samples may be unreliable. No difference in trapability was demonstrated between sexes.--D. E. Davis.

Dorer, R. E. (Va. Dept. Health, Norfolk, Va.) PRACTICAL RATPROOFING. Pest Control 24(8): 12-14, 3 figs. Aug. 1956.

"A comprehensive study of ways to block rat entry into existing buildings and making new structures ratproof by analyzing rat habits, behavior and their great physical versatility."

Fellton, Herman L. (Getz Exterminators, Atlanta, Ga.) ROOF RAT CONTROL IN FOOD PROCESSING PLANTS. Pest Control 24(8): 16, 18, 20, 3 photos. Aug. 1956.

Agility, ratproofing, control measures.

Link, K. P., Ward Ross, D. P. McAlindin, and H. J. Spencer. (U. Wis.) ANTICOAGULANTS: ARE RECOMMENDED DOSAGES FOR NORWAY RAT CONTROL TOO HIGH? Pest Control 24(8): 22, 24, 27, 28, 50. Aug. 1956.

Norway rats are quite vulnerable to anticoagulant poisons and some workers are using baits that are weaker than those usually recommended. Apparently this works well enough with ordinary populations of Norways. But many situations require control of house mice and roof rats as well as Norways, and for these animals the regular dosages are required. Furthermore, some populations of Norways contain marginal feeders; control of these individuals requires both regular dosages and attractive, well-prepared baits.

Schiller, Everett L. (Johns Hopkins U., Sch. Hygiene, Balt. 5, Md.) ECOLOGY AND HEALTH OF RATTUS AT NOME, ALASKA. J. Mamm. 37(2): 181-188, 1 fig. May 1956.

A parasitological study, with notes on ecology and the effect of winter conditions. Severe frostbite damage and high wintering losses were found. Species of helminths are listed as are species of bacteria recovered from rats with severe lung infections.--L. F. Stickel.

SCIURIDS

Arden, G. B., and K. Tansley. THE SPECTRAL SENSITIVITY OF THE PURE-CONE RETINA OF THE GREY SQUIRREL (SCIURUS CAROLINENSIS LEUCOTIS.) J. Physiol. (London) 127(3): 592-602. Mar. 1955. [From J. Mamm. 37(2).]

Gilfillan, Merrill C. (Ohio Div. Wildl.) LESSONS FROM LONGER SQUIRREL SEASONS. Ohio Cons. Bul. 20(9): 13, 28-29, 1 photo. Sept. 1956.

In 1952 Ohio switched from a 15-day season for gray and fox squirrels to a 30-day season. The change can be appraised now on the basis of 5 years of data. The squirrel population remained steady or even increased despite the longer seasons, and more recreational opportunity was afforded hunters. A still longer season is needed for more nearly suitable kill of gray squirrels, especially in the hilly, wooded country of s. Ohio. Figures on these points are supplied.

SCIURIDS--Continued

Jordan, James S. (Ill. Nat. Hist. Surv., Urbana.) NOTES ON A POPULATION OF EASTERN FLYING SQUIRRELS. J. Mamm. 37(2): 294-295. May 1956.
Sex ratios, weights, and reproductive condition of 49 squirrels collected on a 31-acre tract in Ill. The squirrels were collected between Feb. 22 and Mar. 19 by removal trapping. The author concludes that the total of 49 represents the minimum population of the area.--L. F. Stickel.

Tevis, Lloyd, Jr. (Box 308, Rancho Mirage, Calif.) INVASION OF A LOGGED AREA BY GOLDEN-MANTLED SQUIRRELS. J. Mamm. 37(2): 291-292. May 1956.
From their normal habitat on the ridges in nw. Calif., Citellus lateralis moved 2.5 mi. through normally avoided virgin forest to logged sites 1000 ft. lower and established breeding populations of greater density than occur in their normal range.

Uhlig, Hans G. (P. O. Box 358, Fergus Falls, Minn.) THE GRAY SQUIRREL IN WEST VIRGINIA. Cons. Comm. W. Va., Div. Game Mgt., Bul. no. 3. xii + 83 p., illus. 1956.
This important, informative, and well-printed bulletin is based on the author's large, processed report of 1955 (see WR 83: 27). Many sections have been revised and rearranged and some statistical material has been omitted. Apparently this bulletin is intended more for the public than was the original, but it is still a good technical report of several years of study of life history and management. Chapter 1 takes up past and present hunting success in relation to populations. Chapter 2 describes the animal and its variations in W. Va. Chapter 3 discusses at length such topics as reproduction, rearing success, relative importance of spring and summer litters, age determination, age and sex ratios, competitors, enemies, and diseases. Chapter 4 gives data on foods and mast supplies. Chapter 5 discusses den trees and how many are needed, and the significance of leaf nests. Chapter 6 tells about census methods, reports census results, and analyzes effects of hunting and other mortality on populations. Chapter 7 is devoted to management: effects of regulations, desirability of larger harvest, forest types in relation to squirrels, lack of value of refuges, timber-cutting practices favorable to squirrels, preservation of den trees, fence rows, and winter feeding. Two of the major conclusions are that summer litters are much more important to hunters than spring litters, and that heavier squirrel kills could be obtained without reducing future populations.

Uhlig, Hans G. (P. O. Box 358, Fergus Falls, Minn.) REPRODUCTION IN THE EASTERN FLYING SQUIRREL IN WEST VIRGINIA. J. Mamm. 37(2): 295. May 1956.
Breeding season, litter size, and embryo counts of squirrels collected from nest boxes.

Uhlig, Hans G. (P. O. Box 358, Fergus Falls, Minn.) A THEORY ON LEAF NESTS BUILT BY GRAY SQUIRRELS ON SENECA STATE FOREST, WEST VIRGINIA. J. Wildl. Mgt. 20(3): 263-266, 1 fig. July 1956.
An investigation was made of the period of leaf-nest building by gray squirrels. Peaks of building occurred in July and in late Oct. or early Nov., approximately 18 wks. after peaks of spring and summer parturition. The proportion of leaf nests built was almost in the same proportion as spring and summer rearing success as derived from kill of juveniles by hunters. The theory is therefore submitted that juveniles approximately 18 wks. old build the majority of nests. Approximately 1.5 nests per juvenile were built.--H. G. Uhlig.

BEAVER

Choquette, L. P. E., and D. H. Pimlott. (Ecole de Méd. Vétérinaire, St. Hyacinthe, Que.) GASTROINTESTINAL PARASITES OF BEAVER IN NEWFOUNDLAND. Can. J. Zool. 34(3): 209. June 1956.
Occurrence of 3 spp. of worms is discussed.

Fowle, C. D., R. O. Standfield, and A. Fyvie. (Ont. Dept. Lands & For.) THE BEAVER IN ONTARIO. Can. Dept. N. Affairs & Natl. Resources, Wildl. Mgt. Pap. Delivered at 18th Fed.-Prov. Wildl. Conf. p. 27-34, 1 fig. 1954.

Summary: "The beaver in Ontario declined from a high population in 1920 to a low level about 1937, and has risen again by 1953 to what may be regarded as an exceptionally high population. The increase is continuing in most areas although there are signs of leveling-off. These signs include reports of reduced production and house-counts, expansion of distribution, occupation of marginal habitat, reduction in food supply and the occurrence of at least one epizootic. There is some evidence that lack of space and social intolerances are limiting populations. While the basic factors contributing to the increase are not known, we believe that an improved management program for beaver can claim a large share of the credit."

Hacker, Robert G. THE CHARACTER AND SIGNIFICANCE OF BEAVER DAMAGE IN THE VICINITY OF FORT COLLINS, COLORADO. M. S. thesis, Colo. A & M Coll. 125 p., illus. Dec. 1953.--L. E. Yeager.

Hay, Keith G. DEVELOPMENT OF A BEAVER CENSUS METHOD APPLICABLE TO MOUNTAIN TERRAIN IN COLORADO. M. S. thesis, Colo. A & M Coll. 143 p., illus. Dec. 1955.--L. E. Yeager.

Hoover, Robert L. BEAVER ECOLOGY IN THE LONG'S PEAK AREA OF COLORADO. M. S. thesis, Colo. A & M Coll. 262 p., illus. Mar. 1955.--L. E. Yeager.

Lawrence, W. H., L. D. Fay, and S. A. Graham. (Fay: Mich. Dept. Cons.) A REPORT ON THE BEAVER DIE-OFF IN MICHIGAN. J. Wildl. Mgt. 20(2): 184-187, 1 map. Apr. 1956.

Reports occurrence of epizootic tularemia among beavers in Upper Peninsula of Mich. The die-off began in 1953 in the w. counties and spread e. across the peninsula. By 1955 the epizootic appeared to have run its course. A total of 232 dead beavers was reported. Pasteurella tularensis was recovered from one carcass and there were several cases of human tularemia among trappers handling dead or sick beavers. The tick, Ixodes banksi, was found parasitizing beavers, muskrats, and infesting beaver lodges. Ticks usually attached on inner surface of pinna and external meatus of ear. It is possible that I. banksi may be a recent arrival in the Upper Peninsula, as trappers could not recall finding "beaver ticks" prior to 1953. This tick has not yet been incriminated as a vector of tularemia, but field evidence suggests that it may be involved in the epizootic.--W. H. Lawrence.

MacDonald, Duncan. BEAVER CARRYING CAPACITY OF CERTAIN MOUNTAIN STREAMS IN NORTH PARK, COLORADO. M. S. thesis, Colo. A & M Coll. 136 p., illus. Apr. 1956.--L. E. Yeager.

Neff, Don J. ECOLOGICAL EFFECTS OF HABITAT ABANDONMENT BY BEAVERS ON A HIGH MOUNTAIN VALLEY IN COLORADO. M. S. thesis, Colo. A & M Coll. 128 p., illus. Mar. 1956.--L. E. Yeager.

Retzer, J. L., H. M. Swope, J. D. Remington, and W. H. Rutherford. (Rocky Mtn. For. & Range Exp. Sta. and Colo. Game Dept.) SUITABILITY OF PHYSICAL FACTORS FOR BEAVER MANAGEMENT IN THE ROCKY MOUNTAINS OF COLORADO. Colo. Dept. Game & Fish, Tech. Bul. no. 2. 1-33 p., illus. Mar. 1956.

269 miles of 61 streams in w. Colo. were studied. Role of beaver in creating "beaver meadows" is questioned; geology of site seems more influential. Stream grades of more than 15% are not used by beaver; grades of 1-6% are best. Narrow valleys are unfavorable but not limiting unless no wider than channel. The wider the valley the better. Sites with easily eroded rocks such as shale or shale-sandstone are unsuitable because of likelihood of highly damaging washouts. Hard rocks and glacial till are favorable. These factors are combined to form a classification of sites as excellent, good, questionable, or unsuitable for beaver. Planting and control of beaver should be governed by site classification. Numerous photographs, 11 graphs, and 5 tables help give good understanding of points discussed.

Rutherford, Wm. H. INTERRELATIONSHIPS OF BEAVERS AND OTHER WILDLIFE ON A HIGH-ALTITUDE STREAM IN COLORADO. M. S. thesis, Colo. A & M Coll. 134 p., illus. Mar. 1954.--L. E. Yeager.

Tener, J. S. (Can. Wildl. Serv.) BEAVER MORTALITY. Can. Dept. N. Affairs & Natl. Resources, Wildl. Mgt. Pap. Delivered at 18th Fed.-Prov. Wildl. Conf. p. 35-38. 1954.

Recent beaver die-offs have occurred in high-density populations. Often neither tularemia nor pseudotuberculosis nor any other disease could be diagnosed. Tener suggests that overpopulations produced stress and that stress was the factor that made populations vulnerable to various mortality factors. The Can. Wildl. Serv. has launched studies of beaver die-offs. We should also study adrenal weights of populations of various densities and we should determine how high a population is too high.

MUSKRAT AND NUTRIA

Bednarik, Karl. THE MUSKRAT IN OHIO LAKE ERIE MARSHES. Ohio Div. Wildl. iii + 67 p., illus. 1956.

This booklet begins with description of the Erie Marshes and the water-level fluctuations that complicate ecology and management. Food habits of muskrats are discussed on the basis of much study. Weights are tabulated and discussed; the heaviest muskrats came from cattail and bur-reed stands. Construction and use of houses and other structures made by muskrats are discussed. Reproduction is treated under the headings Reproductive Cycle, Uterine Examination, Time of Mating, Gestation Period, Parturition, Number of Litters, Number of Young, and Sex Ratio of Juvenile Muskrats. Age and sex ratios of trapped 'rats are tabulated. A few data are given on travels. Predation is considered at length, with tables reporting food habits of mink, raccoon, and Norway rat. The Norway rat was an important predator of muskrat kits. Occurrence of Errington's disease is considered briefly. Currently used methods of marsh management, such as ditching and water-level control by pumping are described. Burning is common but of no ecological value; if done at certain times it destroys many young and adults as well. The author demonstrated that artificial supports were used for house bases and that provision of such supports might be a worthwhile management measure. Trapping procedures in the area are described and recommendations are made for the best times to trap. Much information from the literature is worked into the text of this paper, but the ms. must have been in press for several years, as a number of recent publications are not mentioned or cited.

Davis, W. B. (Texas A & M Coll.) NUTRIAS CAN MEAN TROUBLE. Texas Game & Fish 14(6): 15, 23, 1 photo. June 1956.

Dr. Davis gives a good review of nutria biology and then tells why he believes that we have laid the foundation for serious economic and recreational losses by introducing these animals. Pelts of Am. nutrias bring low prices; most pelts of wild U. S. nutrias are rejected as worthless by fur buyers. Because nutrias compete with valuable muskrats, it seems exceedingly unwise to permit further spread of nutrias in the U. S. Do nutrias really clean vegetation out of lakes and ponds? Well, they do reduce various kinds of aquatic plants, but they won't eat algae or many sorts of submerged plants. Once established in a lake or pond, overpopulation soon occurs. Then the nutrias move to places they are not wanted or where they destroy vegetation wanted for waterfowl and muskrats. This happened at Eagle Lake in Colorado Co., Texas. There 5 nutrias were stocked. Now waterfowl values are seriously damaged. The club has spent hundreds of dollars in attempts to eliminate nutria. Over 2,000 have been killed and a sizable population remains.

FUR ANIMALS, GENERAL

Atkeson, Thomas Z. (Box 1643, Decatur, Ala.) INCIDENCE OF CRIPPLING LOSS IN STEEL TRAPPING. J. Wildl. Mgt. 20(3): 323-324. July 1956.

Trapping was done on Wheeler Natl. Wildl. Refuge during legal seasons, 1949-55. Twelve to 18 local men of widely varying experience did the trapping. They tended to prefer small traps. Commonest trap was the long-spring size 1.5. Trappers were asked to report all crippling. Animals were considered crippled if they pulled out of traps, wrung off or gnawed off feet, or escaped with traps. Crippling occurred with 27.6% of minks, 24% of raccoons, 2.9% of opossums, 2.1% of striped skunks, and 26% of foxes (reds and grays not separated). Low percentage for opossums and skunks reflects their lack of tendency to struggle. Some trap-cripples recover but many die. Opossums, foxes, and skunks seldom survive the loss of a foot.

Newby, Fletcher. (Mont. Game Dept.) FUR PRODUCTION IN MONTANA. Mont. Wildl. 6(1): 7-13, 5 figs. Spring 1956.

The Mont. fur crop produces an income of about $335,250 per year. If this is regarded as a 4% yield on an investment, the state's fur resource is worth more than $8 million. Beaver, mink, muskrat and marten produce over 90% of the pelts and nearly all the income. More than 25,000 beaver were taken in 1954-55--more than in any other state or Alaska--and their furs brought over $300,000. The present paper gives much information on the 1954-55 trapping season, with emphasis on composition of catch and trapping pressure in Eastern, Central, and Western Mont. It also tells how regulations were adjusted to obtain lighter or heavier trapping pressures for the important species in different areas.

Pearson, J. C. (Ont. Res. Found., Toronto.) STUDIES ON THE LIFE CYCLES AND MORPHOLOGY OF THE LARVAL STAGES OF ALARIA ARISAEMOIDES AUGUSTINE AND URIBE, 1927 AND ALARIA CANIS LaRUE AND FALLIS, 1936 (TREMATODA: DIPLOSTOMIDAE). Can. J. Zool. 34(4): 295-387, 79 figs. Aug. 1956.

Detailed study of these parasites of carnivores.

BEARS

Lauckhart, J. Burton. (Wash. Dept. Game.) THE EFFECT OF LOGGING OLD-GROWTH TIMBER ON BEAR. 1955 Proc. Soc. Am. For. Meeting. p. 128-130. 1956.

Facts and figures on bear damage to forests are reviewed and cause and control are discussed. The author believes that heavy bear populations built up during early stages of forest recovery from lumbering. As the habitat became unfavorable through growth of trees, bears were forced to eat cambium because of shortage of other foods. Bear populations reduced by control are not likely to regain their former densities in these maturing forests. There may, however, be a bear-problem stage through which future forests must pass. Four bears per sq. mi. can cause heavy damage. Trapping proved best form of control because it gets the resident bears and does not scatter them as does hunting with dogs. Cost of control has been $17 per bear, which is considered reasonable. Damage has dropped from 50% in some areas to less than 8% after control. Three out of every 4 bears caught had fed on trees to some extent during spring and summer.

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) UNUSUAL PATHOGENICITY OF DIPHYLLOBOTHRIUM SP. IN A BLACK BEAR. Proc. Helminth. Soc. Wash. 22(2): 95-97, 3 figs. July 1955.

RACCOON, RINGTAIL, COATI

Penner, L. R., C. F. Helmboldt, and Anne L. Griswold. (U. Conn.) EURYTREMA PROCYONIS IN A RACCOON FROM CONNECTICUT. Proc. Helminth. Soc. Wash. 21(1): 34-35, 1 fig. Jan. 1954.

Heavy infestation of this fluke in pancreas was pathological, perhaps lethal.

Sharp, Ward M., and Louise H. Sharp. (Pa. State U.) NOCTURNAL MOVEMENTS AND BEHAVIOR OF WILD RACCOONS AT A WINTER FEEDING STATION. J. Mamm. 37(2): 170-177, 2 figs. May 1956.

For three winters, Nov.-Mar., at Valentine Natl. Refuge, Nebr., observations were made each half hour until 1 a.m., and then each hour until 6 a.m. The majority of the population fed and departed before midnight; a warier segment of the population arrived between 1:30 and 3:30 a.m. A form of social order existed at the feeding station. Females with young had freedom of the area and tolerated each other. Young were driven aside when their mothers were absent. Groups of raccoons arriving together supplanted single individuals, or if a group was already present, single individuals were driven away. Other arriving groups were tolerated after exchange of threatening gestures. Temperature and winds were factors limiting activity. Approaching cold fronts were reflected in behavior of adults at least 48 hours in advance.--L. F. Stickel.

Walton, Bryce C. IDENTIFICATION OF A TRYPANOSOME FROM PROCYON LOTOR LOTOR FROM MARYLAND AS TRYPANOSOMA CRUZI (CHAGAS). Ph. D. thesis, U. Md. 24 p., 3 figs. 1956.

MUSTELIDS

Chapman, Floyd B. (Ohio Div. Wildl.) THE RIVER OTTER IN OHIO. J. Mamm. 37(2): 284. May 1956.

Four recent records from e. Ohio.

Freeman, Reino S. (Ont. Res. Found., Toronto.) LIFE HISTORY STUDIES ON TAENIA MUSTELAE GMELIN, 1790 AND THE TAXONOMY OF CERTAIN TAENIOID CESTODES FROM MUSTELIDAE. Can. J. Zool. 34(4): 219-242, 3 figs., 1 pl. Aug. 1956.

Goldberg, Aaron. (US Bur. Anim. Indus.) PARASITES OF SKUNKS IN THE BELTSVILLE, MARYLAND, AREA. Proc. Helminth. Soc. Wash. 21(1): 29-34. Jan. 1954.

Harrison, R. J., and E. G. Neal. (London Hosp. Med. Coll., London E.1, England.) OVULATION DURING DELAYED IMPLANTATION AND OTHER REPRODUCTIVE PHENOMENA IN THE BADGER (MELES MELES L.). Nature 177(4517): 977-979, 3 figs. May 26, 1956.

Good data on reproduction and the reproductive cycle of the badger in Great Britain.

Quick, Horace F. (U. Maine.) EFFECTS OF EXPLOITATION ON A MARTEN POPULATION. J. Wildl. Mgt. 20(3): 267-274. July 1956.

Exploitation of fur resources in a wilderness region in n. B. C. was studied 1947-49. 250 Martes americana were collected from trap lines. These represented 16% of the catch from an area of 20,000 sq. mi. Age structures of hypothetical populations were postulated from basic breeding data. These were used as criteria to compare sex-age structure of kills to measure level of exploitation. Level of exploitation was expressed grossly as "under-utilized" or "utilized at optimum level." Lightly trapped lines produced a preponderance of males. Heavily, continuously trapped lines produced catches of even sex ratio and of predominantly young animals. In general, Indians under-utilize marten populations on their registered trap lines. Some white trappers utilize the population at optimum level; that is, they harvest a "normal yield." Normal yield was measured by number of marten in catches sustained over a period of years. On the whole, catches appeared to be somewhat below the actual productive capacity of the population. Factors causing under-utilization are instability of fur market and sociologic factors that affect native trappers. Some indication of control of population cycles was observed; marten populations have been relatively stable because of a near-optimum level of exploitation. Lynx populations have continued to fluctuate, perhaps because of under-exploitation resulting from economic cycles.--H. F. Quick.

Sprent, J. F. A. (Ont. Res. Found., Toronto 5.) ON AN ASCARIS PARASITE OF THE FISHER AND MARTEN, ASCARIS DEVOSI SP. NOV. Proc. Helminth. Soc. Wash. 19(1): 27-37, 13 figs. Jan. 1952.

DOGS, WOLVES, FOXES

Arnold, David A. (Mich. Dept. Cons.) RED FOXES OF MICHIGAN. Mich. Dept. Cons. 1-48 p., with numerous cartoons by Oscar Warbach. 1956.
An excellent, authoritative, popular booklet. It is written and illustrated in a light vein, but contains in brief a great deal of information on fox biology and management. The author and his associates have studied foxes for years and the results are distilled and presented here in highly potable form. Warbach's fine cartoons alone would put over many of the author's points. Sections of the pamphlet discuss fox reproduction, travels, foods, evidence that foxes haven't affected pheasant trends, why every piece of game a fox gets isn't one less for the hunter, why bounty schemes have failed and how foxes have fluctuated in spite of them, how troublesome foxes should be controlled by the extension trapper system, ways in which foxes are hunted, fluctuations of fox populations, and factors that affect foxes adversely (diseases, etc.). The paper ends with a plea for valuing the fox for what he is and learning to live with him.

Babero, Bert B., and Robert Rausch. (Arctic Health Res. Center, Anchorage, Alaska.) NOTES ON SOME TREMATODES PARASITIC IN ALASKAN CANIDAE. Proc. Helminth. Soc. Wash. 19(1): 15-17, 1 fig. Jan. 1952.

Choquette, L. P. E. (Ecole de Méd. Vétérinaire, St. Hyacinthe, Que.) OBSERVATIONS ON EXPERIMENTAL INFECTION OF DOGS WITH ECHINOCOCCUS. Can. J. Zool. 34(3): 190-192. June 1956.
Abstract: "Observations on the maturity of Echinococcus granulosus adults, their longevity in situ, the physical aspects of immature, mature, and senile segments eliminated in the faeces, and on the pathogenicity of the adult worm were made during the course of experimental infection of dogs."

Findley, James S. (U. of S. Dak.) COMMENTS ON THE WINTER FOOD OF RED FOXES IN EASTERN SOUTH DAKOTA. J. Wildl. Mgt. 20(2): 216-217. Apr. 1956.
Food items found in stomachs of 26 foxes, most of which were shot in pheasant cover. Percentage of occurrence of pheasant was 65, which is exceptionally high as judged by other studies cited. Percentage of occurrence of various small rodents ranged from 3.9 to 27. Representation of Lepus townsendii was 19.2%, of Sylvilagus floridanus, 11.5%.

Sullivan, Edward G., and Arnold O. Haugen. (S. C. Wildl. Resources Dept.) AGE DETERMINATION OF FOXES BY X-RAY OF FOREFEET. J. Wildl. Mgt. 20(2): 210-212, 1 photo. Apr. 1956.
Red and gray foxes in Ala. can be classified through Nov. as adults or young of year by x-rays of distal epiphyses of radius and ulna. Final date for collecting fox feet from trappers in different regions should be not later than 8 months following earliest whelping of pups in that area. Kodak no-screen safety film with exposures of 60KVP at 20MA at one-half second at 36" produced good x-rays of the feet.--Authors.

CATS

Anon. [PANTHERS IN ALABAMA.] Ala. Cons. 27(5): 26. Mar.-Apr. 1956.
Records 2 recent reports of panthers in Ala. The body of a cow was found covered with leaves and twigs in Dale Co. Traps set nearby caught a young panther. In Washington Co., large, round tracks thought to be those of panther were found near where a deer had been attacked.

Curry-Lindahl, Kai. LONS LYNX LYNX HISTORIA OCH NUVARANDE FÖREKOMST I SVERIGE OCH ÖVRIGA EUROPA (History and present status of lynx in Sweden and the rest of Europe). Sveriges Nature for 1951. p. 122-162, 2 graphs, 6 maps, 3 photos. 1951.
In Swedish. An interesting and documented account (with maps) of the history of lynx in the Swedish provinces and the nations of Europe. Based on hunting records in Sweden from 1827 to 1949, numbers of lynx harvested have declined gradually from an av. of 250 a year in the early 1800s to 5 in 1949. Norway's records on numbers of lynx probated for bounties have shown a similar decline since 1846. Not only have numbers of lynx declined, but the range has been

severely reduced in these 2 countries. The lynx has gradually declined in numbers in Finland and has disappeared entirely from the Pyrenees and central Europe since 1800. The lynx did not exist during historic times in Great Britain and Denmark, but fossil remains have been found in both countries.--V. F. Flyger.

Westfall, Claude Z. (U. Maine.) FOODS EATEN BY BOBCATS IN MAINE. J. Wildl. Mgt. 20(2): 199-200. Apr. 1956.

101 bobcats were collected Sept.-Mar., 1951-54. Analysis of contents of stomachs and large intestines revealed that deer, snowshoe hare, red squirrel, and porcupine comprised 86% of the food. Other foods are listed.--C. Z. Westfall.

BIG GAME, GENERAL

Aldous, Clarence M. (US F&WS, Fed. Bldg., Salt Lake City, Utah.) CONDUCTING DEER STUDIES WITH THE USE OF A HELICOPTER. J. Wildl. Mgt. 20(3): 327-328. July 1956.

The helicopter provides a means for making more accurate, detailed, big-game studies than other methods now in use. Advantages are pointed out and suggestions for use are given. The original cost, $27,000 to $31,000, makes ownership prohibitive for many game departments. Rental, with pilot, costs $85 per hour.--C. M. Aldous.

Allen, Rex W., and Cecil B. Kennedy. (US Bur. Anim. Indus.) PARASITES IN A BIGHORN SHEEP IN NEW MEXICO. Proc. Helminth. Soc. Wash. 19(1): 39. Jan. 1952.

Anon. TUSKER TUG OF WAR. Fla. Wildl. 10(1): 20-21, 7 photos. June 1956.

Fla. is trapping and transplanting wild razorback hogs by the hundreds into game management areas, where they are legal game.

Banfield, A. W. F. (Can. Wildl. Serv., Ottawa.) THE CARIBOU CRISIS. The Beaver 286: 3-7, 4 figs. Spring 1956.

Once there were some 2.5 million barren ground caribou between Hudson Bay and the Mackenzie Valley. An aerial survey completed in 1949 revealed that the area then had about 670,000 caribou. Production of young was about 140,000 per year, kill by man was about 100,000 and kill by wolves was about 34,000. Total mortality of 178,000 exceeded production by some 33,000 a year. A thorough resurvey of the area in 1955 indicated a decline to 277,000--a loss of 60% in the last 6 years. Greatest decline was in Mackenzie District. Keewatin held level. The total decrease was 50% more than anticipated. Some natives were starving. Why the decline? There is no apparent food scarcity and no great loss of range. Calf crops dropped to less than half the usual 20% in 3 of the 6 years. Blizzards can cause severe loss of young, but there are few data on them. Wolves certainly are not responsible to any high degree, but extensive control of them has been undertaken, largely by poison stations placed on large frozen lakes. Kill by man is still far too large and accompanied by terrific wastage. Understanding of the situation by northern people is necessary, for legislation can have limited effect in the areas where caribou are, and are likely to remain, a vital necessity.

Buttery, Robert F. (Bureau Indian Affairs, Elko, Nev.) RANGE CONDITIONS AND TRENDS RESULTING FROM WINTER CONCENTRATIONS OF ELK IN ROCKY MOUNTAIN NATIONAL PARK, COLORADO. M.S. thesis, Colo. A & M Coll. 1955. Long abstract in J. Range Mgt. 9(3): 148. May 1956.

"Statistical analysis of the data indicated that the concentration areas have been damaged to a considerable extent in the past, particularly along Fall River... Timbered areas were found to be in slightly better condition than open areas. The concentration areas, as a whole, were in fair range condition and progressing toward a better condition. Upward trends in range condition were sufficiently apparent to show that the elk reduction program has been beneficial to the range, and its continuation seems advisable..." Reduction has permitted improvement of concentration areas without lowering elk numbers enough to impair their scenic values. "Browse species...should be allowed up to 40 percent of total density in judging condition of elk range."

Edwards, R. Y. (B. C. For. Serv., Victoria.) SNOW DEPTHS AND UNGULATE ABUNDANCE IN THE MOUNTAINS OF WESTERN CANADA. J. Wildl. Mgt. 20(2): 159-168, 6 figs. Apr. 1956.

Groups of years with deep snow winters, and groups with shallow snow winters, have alternated in B. C. Population declines in wild ungulates have occurred in the deep snow periods. These declines have been blamed in the past on a long and varied list of supposed causes. Snow depths appear to be the primary cause of many factors thought important in winter mortality of native ungulates. Limited information from Alberta and Alaska indicates that the former has experienced similar weather and ungulate fluctuations, while the latter shows no conclusive agreement. The magnitude of declines due to snow may vary with characteristics of winter ranges concerned, depending upon degree to which snow renders range resources unavailable. In addition, what appears to be over-use of forage or browse in deep snow years may be limited to a small part of the range used at other times. Public acquisition of small areas of low-elevation winter range may be essential to perpetuate the publicly owned ungulate resource over large areas.--R. Y. Edwards.

Epling, Glenwood P. (Colo. A & M Coll.) MORPHOLOGY OF THE SCENT GLAND OF THE JAVELINA. J. Mamm. 37(2): 246-248, 1 pl. May 1956.

Graf, William. TERRITORIALISM IN DEER. (San Jose State Coll., Calif.) J. Mamm. 37(2): 165-170. May 1956.

A description of sign-post marking by Roosevelt elk, with a discussion of its significance. Similar behavior by other deer is discussed. The author concludes that antler rubbing for the sole purpose of removing velvet does not occur, though some velvet may be removed incidental to rubbing antlers for other purposes.--L. F. Stickel.

Honess, Ralph F. (Wyo. Game Comm.) THE EIMERIA OF ELK CERVUS CANADENSIS NELSONI WITH A DESCRIPTION OF A NEW SPECIES. Wyo. Game & Fish Comm. Bul. 8, art. 4: 25-28, 1 fig. June 1955.

Includes key to Eimeria known from cervids of world.

Keiss, R. W., and S. M. Morrison. (Colo. A & M Coll.) IDENTIFICATION OF COLORADO BIG GAME ANIMALS BY THE PRECIPITIN REACTION. J. Wildl. Mgt. 20(2): 169-172, 1 photo. Apr. 1956.

The precipitin reaction was applied to identification of blood stains and meat extracts of Colo. big game and to some domestic animals. Specific antisera for elk, deer, antelope, bighorn, horse, cow, sheep and human were prepared by single intramuscular injections of alum-precipitated blood serum into White Leghorn chickens. These antisera gave high-titered homologous interfacial reactions when tested against extracts of meat or of blood stain, and low-titered heterologous reactions against related species. The difference in titer, speed, and intensity of reaction, however, was great and the heterologous reactions did not interfere with accurate identification. Attempts at removing the heterologous reaction lowered the specific reaction.--S. M. Morrison.

Marquardt, Wm. C., and C. M. Senger. (Mont. Vet. Res. Lab., Bozeman.) LUNGWORMS IN THE BIGHORN SHEEP OF MONTANA. Proc. Helminth. Soc. Wash. 23(1): 68-69. Jan. 1956.

Incidence and lesions. Only 2 of 19 sheep were free of these worms.

McLucas, Jim. (Mont. Game Dept.) MONTANA'S BIG GAME TRANSPLANTING PROGRAM. Mont. Wildl. 6(1): 22-24, map. Spring 1956.

Reviews transplants and their results for deer, antelope, mountain goat, and bighorn.

Moisan, Gaston. (Fish & Game Dept., Quebec.) LATE BREEDING IN MOOSE, ALCES ALCES. J. Mamm. 37(2): 300. May 1956.

Cow with calf a few hours old on Aug. 14, 1954.

Moser, Clifford A. (Colo. Dept. Game.) THE BIGHORN IN COLORADO. Colo. Outdoors 5(5): 18-22, 6 photos. Sept.-Oct. 1956.

A major reason for permitting hunting was to scatter herds. This aim has been achieved in many areas. 183 sheep were bagged in 3 years for hunter success of 28.7%. Ewes were made legal in 1 area where it was desired to thin out the herd because of 100% incidence of lungworms. Food samples from shot animals indicated that grasses and sedges comprise 75% of diet. Important grasses are listed. Browse constitutes 19% of diet, with shrubby cinquifoil and willow being most browsed. Willows are important foods throughout year. Forbs made up 6.2% of diet, with alpine clover in the lead. Scarcity of winter range with snow-free slopes is a limiting factor. Three-fourths of all lungs examined gave evidence of lungworm infestations. One herd (Arkansas Canyon) was free of this parasite. Salt and phenothiazine were tried for worm control; under range conditions too little is taken to be of medicinal value. Control of lungworm still depends on scattering or thinning herds.

Riney, Thane. (N. Z. For. Serv., Wellington.) DIFFERENCES IN PROPORTION OF FAWNS TO HINDS IN RED DEER (CERVUS ELAPHUS) FROM SEVERAL NEW ZEALAND ENVIRONMENTS. Nature 177(4506): 488-489. Mar. 10, 1956.

"New Zealand fawn/hind ratios show highly significant differences in the five environments tested. Fawn/hind ratios range from 28 (±10)/100, in Central North Island, to 70(±14)/100 in the Nelson-Marlborough area, South Island... Such difference perhaps could be expected in New Zealand, as red deer range over a wide variety of contrasting environments... Fawn/hind ratios varied more between different areas than similar ratios taken from the same area for two consecutive years..."

Ritcey, R. W., and R. Y. Edwards. (B. C. For. Serv., Victoria.) TRAPPING AND TAGGING MOOSE ON WINTER RANGE. J. Wildl. Mgt. 20(3): 324-325. July 1956.

Large traps of aspen poles between cedar posts have taken 60 moose in 2 winters. Lead fences funnel migrating moose toward the traps. Trap walls must be at least 8 ft. high. Additional moose have been tagged as calves captured by hand in favoured calving areas. Techniques are discussed.--R. Y. Edwards.

Schantz, Homer L. (454 Pasco del Descanso, Santa Barbara, Calif.) BIG GAME POPULATIONS IN THE NATIONAL FORESTS, 1921 TO 1950. For. Sci. 2(1): 7-17, 1 graph. Mar. 1956.

A serious effort to estimate population trends and rates of increase or decrease for all national forests collectively. Species of big game and big game collectively are treated. Much tabular information is given from annual Forest Service estimates. Possible rates of reproduction are weighed against observed population trends and hunter take. Number of big-game animals rose from some 585,000 in 1921 to about 2,957,000 in 1950. Hunter take av. 7.9% but rose to 12% in 1950. The kill should have been much greater, especially for such animals as deer. Elk have been better harvested, with kill of 17.2% in 1950. Increase of black bear (increases are estimated throughout on a compound interest basis) was at rate of 2-3% despite kill of 8.4%. Pronghorns increased more rapidly than any other species; the rate was about 17% from 1921-31 and about 7.8% for the whole period. Mtn. goats have increased but little, only 1.2% from 1934-50. They thrive outside their original range and might well be transplanted more. Moose increased 2.4% for the whole period. Bighorns are the only big game that have decreased. Overall rate of bighorn decrease was 1.1%. The decline has continued in Alaska but has been reversed in the states. Grizzly and brown bears have decreased slightly in the states but have increased about 3.0% if Alaska is considered. "Antelope were 11.4 times as numerous in 1950 as in 1920, deer 6 times, elk 5.5 times, big game 5.4 times, black bear 2.6 times, moose 2.6 times, and grizzly and Alaska brown bear 2.3 times. Mountain goat have about held their own but bighorn have been reduced by about one third."

Young, Stanford. SURVEY AND EVALUATION OF BIG GAME EXCLOSURES IN UTAH. M. S. thesis, Utah State Agr. Coll. 70 p. 1955.
See WR 84: 28.

DEER (Odocoileus)

Anderson, Roy C. (Ont. Res. Found., Toronto.) ELAPHOSTRONGYLUS ODOCOILEI HOBMAIER AND HOBMAIER, 1934 IN THE CRANIAL CASE OF ODOCOILEUS VIRGINIANUS BOREALIS MILLER. Can. J. Zool. 34(3): 167-173, 12 figs. June 1956.
These worms can cause serious damage to the central nervous system.

Cheatum, E. L. (N. Y. Cons. Dept.) TOO MANY DEER? N. Y. State Cons. 10 (6): 2-4, 2 photos. June-July 1956.
The hard winter of 1955-56 caused heavy fawn mortality in N. Y., not only in the Adirondacks but in the Catskills. Artificial feeding was tried with generally unsatisfactory results. But browse provided by organized browse-cutting expeditions was almost completely utilized. Starvation could occur again any winter and there is no simple solution to the problem. Needed are better organized and more systematic deer harvests, and deer range improvement, especially near wintering areas. The bulk of this paper consists of facts and figures on populations, birth rates, sex ratios, and food needs of N. Y. deer, all of which is explained as background for understanding winter starvation and the need for herd control.

Clover, Melvin R. (Calif. Dept. Game.) SINGLE-GATE DEER TRAP. Calif. Fish & Game 42(3): 199-201, 1 fig. July 1956.
Plans, description, and bill of materials for improved trap. Recommendations for trapping and handling deer are included.

Dahlberg, Burton L., and Ralph C. Guettinger. (Wis. Cons. Dept.) THE WHITE-TAILED DEER IN WISCONSIN. Wis. Cons. Dept., Tech. Wildl. Bul. no. 14. 1-282 p., illus. 1956.
Encyclopedia of Wis. deer study written for both laymen and professionals. It summarizes findings of the deer project for 15 years, 1941-54. All subjects that pertain to deer management in Wis. are considered, many of them at length. The volume is an outstanding contribution to our knowledge of deer and should be in the hands of all big-game biologists. It should be of real value in educating the public on deer management. The first 3 chapters discuss history of Wis. deer and deer problems. The next 6 chapters present life history data on such subjects as breeding season, travels, homing, food habits, weights in relation to range, reproduction, sex ratios, seasonal herd composition, and mortality factors. Chapter 10 takes up the life equation. Chapters 11-15 analyze range problems, with consideration of summer and winter range, crop damage, range surveys through the years, artificial feeding, and carrying capacity. Chapters 16-19 are devoted to management problems: changing hunting patterns, hunter behavior, the varying regulations, the possibility of management by units, habitat management, and future outlook. Twelve appendixes summarize data on various topics including methods of aging deer, check list and identification of browse species, diseases and parasites, kill records, extent of deer range per county, records of deer yard checks, and project publications. The book is printed on glazed paper and is elaborately illustrated with photographs and maps.

Dasmann, Raymond F., and Richard D. Taber. (Humboldt State Coll., Calif.) BEHAVIOR OF COLUMBIAN BLACK-TAILED DEER WITH REFERENCE TO POPULATION ECOLOGY. J. Mamm. 37(2): 143-164, 4 figs. May 1956.
A population and behavior study of marked deer on a 400-acre area in Calif. The deer were nonmigratory and tended to occupy restricted home ranges throughout the year. Movements beyond home range boundaries were infrequent, and consisted of rutting season travels, wandering, and dispersal. Home range observations favored the concept of definite boundary limitations rather than declining activity from center to periphery with no definite outer boundaries. The stable social aggregations were the family and buck groups. Feeding bands formed temporarily. Adult does were mutually intolerant while fawns were young, and their ranges were exclusive. No such spacing was found among bucks. Aggression, alarm behavior, and play were all related to population density.--L. F. Stickel.

French, C. E., L. C. McEwen, N. D. Magruder, R. H. Ingram, and R. W. Swift. (Pa. State U.) NUTRIENT REQUIREMENTS FOR GROWTH AND ANTLER DEVELOPMENT IN THE WHITE-TAILED DEER. J. Wildl. Mgt. 20(3): 221-232, 7 figs. July 1956.
Young males were raised on raw whole milk, calf starter, and alfalfa hay until 6 mos. old, when they were started on exptl. diets composed of natural feedstuffs. A nutritively complete ration was fed 4 deer as positive controls

and 2 were fed the same diet but only half the amount. Two deer were fed a ration complete except for Ca and 2 others were fed the same ration supplemented with $CaCO_3$. Similarly, other rations were compounded to be deficient in P, Ca and P, protein, S, or S-amino acids. First year growth indicated a requirement of about 4 lbs. of good-quality air-dry feed per 100 lbs. body wt. Protein requirement for optimal growth was 13-16%. Ca and P requirements were in excess of 0.09 and 0.25%, respectively. Supplements of S, S-amino acids, vit. A and D, and trace minerals were of little value. Body growth took precedence over antler growth. Only deer on complete rations, weighing 135-180 lbs., developed large, branched antlers with 6-8 points. Second year growth and maintenance indicated a requirement of about 3 lbs. dry feed per 100 lbs. body wt. and somewhat decreased protein and mineral requirements. All deer ate less and lost wt. voluntarily during rutting season and late winter despite ready availability of food and water. They ate more and gained wt. rapidly during spring and summer months.--C. E. French.

Gill, John. (Maine Game Div., Orono.) REGIONAL DIFFERENCES IN SIZE AND PRODUCTIVITY OF DEER IN WEST VIRGINIA. J. Wildl. Mgt. 20(3): 286-292, 1 map. July 1956.

Information was obtained from about 17,000 legally killed deer during hunting seasons 1951-54. Data included sex, age, hind-foot length, beam diameter and length of antler, number of antler points, carcass wt., and number of corpora lutea. Coefficients of variation indicated that length of hind foot exhibited much less dispersion than other measurements. This measurement was selected as the primary criterion for comparing deer of various parts of the state. Significant differences between mean hind-foot lengths were used to divide the state into 4 regions. Deer of a region had rather constant foot lengths and other characteristics. Foot lengths and carcass wts. were successively lower in West, Allegheny, South, and East regions. In parts of West Region, fawns were twice the average weight, at hunting season, of fawns in parts of East. Three regions (West, Allegheny, and East) ranked in the same order as above on the basis of antler-beam diameter and ovulation rate. Antlers were smaller in South Region than in East. Based on fawn/doe ratio and mean age of adult does in legal kills, the 4 regions ranked in the order indicated by hind-foot length and carcass weight. Causes of differences between regions are unknown. Knowledge of differences was useful to the Cons. Comm. of W. Va. in determining policy regarding harvest management.--John Gill.

Graham, S. A. (U. Mich.) DEER AND DESTINY. Mich. Cons. 25(4): 19-22, 4 photos. July-Aug. 1956.

Exclosure and other studies in hardwood forest of n. Mich. show that high deer populations are eliminating tree reproduction at some points. In other places, only sugar maple is surviving and it will soon grow out of reach and provide no deer food or cover. Conifers, necessary for winter cover, are eliminated by deer. Birch and other desirable species are being killed or held back by deer and consequently dominated by maple. Even maple is held back by browsing, as judged by exclosures. These situations are common in the w. part of the N. Peninsula. [See also WR 78; 48 for more technical report on this work.]

Kitts, W. D., I. McT. Cowan, J. Bandy and A. J. Wood. (U. of B. C., Vancouver.) THE IMMEDIATE POST-NATAL GROWTH IN THE COLUMBIAN BLACK-TAILED DEER IN RELATION TO THE COMPOSITION OF THE MILK OF THE DOE. J. Wildl. Mgt. 20(2): 212-214. Apr. 1956.

Three milk samples from deer taken in B. C. yielded fat content of 10.2-10.5; protein of 8.14-9.56; lactose of 3.91-4.67; ash of 1.30-1.62; water of 74.6-75.5 and total solids of 24.5-25.4. These were higher than the only other data (for a Californian specimen) in fat and total solids. The differences may be associated with latitude and thus climate. Gross caloric content of deer milk is estimated as 750 kilo-calories per lb. as opposed to cow 340, sow 550 and reindeer 1250. A formulation is presented for substitute milk for raising deer fawns.--I. McT. Cowan.

Krefting, L. W., and A. B. Erickson. (US F&WS, St. Paul, Minn.) RESULTS OF SPECIAL DEER HUNTS ON THE MUD LAKE NATIONAL WILDLIFE REFUGE, MINNESOTA. J. Wildl. Mgt. 20(3): 297-302, 1 graph. July 1956.

There were few white-tailed deer on the 93 sq. mi. Mud Lake Refuge in nw. Minn. when the area was made a refuge in 1937. Unlike most deer herds, this herd did not irrupt as a result of protection. The population increased from an estimated 50 in 1940 to 350 in 1945 and to approximately 1,300 by 1949. Winter mortality, losses from spring floods, and heavy kills outside the refuge apparently held down the herd. Special hunts were held in 1949 and 1951-54. Each year about 20,000 acres or half of the refuge deer range was hunted. Checking stations were manned to gather information on wt., sex, and age of deer and residence of successful hunters. An estimated 4,750 hunters bagged 1,470 deer for a success ratio of 31%. Fawn productivity ranged from 136 to 179 fawns per 100 does. After 5 hunts the sex ratio tended to become more even for fawn and adult deer. Weights of adult bucks decreased from 185 to 155 lbs., the does weighed about the same (130 lbs.), and both sexes of fawns showed significant weight differences of 3 to 8 lbs. Av. age of herd was reduced by .4 of a year (2.0 to 1.6 yrs.) but av. age of adult deer (2-1/2 yrs. and older) remained about the same (3.8 yrs.).--L. W. Krefting.

Kuhlmann, Karl. THE AIRPLANE IN UNIT SAMPLING OF MULE DEER POPULATIONS IN HARDING COUNTY, SOUTH DAKOTA. M. S. thesis, Utah State Agr. Coll. 64 p. 1956. [From Quart. Rep. Utah Coop. Wildl. Res. Unit 21(2).]

Landram, James F., and Ralph F. Honess. (Texas Agr. Exp. Sta., Angleton.) SOME INTERNAL PARASITES OF THE MULE DEER ODOCOILEUS HEMIONUS HEMIONUS IN WYOMING. Wyo. Game & Fish Comm. Bul. 8, art. 3: 13-22, 2 figs. June 1955.

Records both protozoan and helminth parasites. One section discusses and keys the species of Eimeria known from cervids of world.

Longhurst, Wm. M. (Box 308, U. Calif. Field Sta., Hopland, Calif.) POPULATION DYNAMICS OF DEER. Calif. Agr. 10(7): 9-10, 12, 14, 3 figs. July 1956.

Four-year study of blacktail deer at Hopland Field Sta., Mendocino Co., Calif. There were 1,000 sheep on the 5,000-acre station. Numbers of deer fluctuated; population was about 1 deer per 9 acres after 1954 hunt. Production was only 107 fawns per 100 does as consequence of poor nutrition. Only 4-year old does approached potential production. Of all known losses, starvation, accidents, parasites, disease, and predation accounted for 47%. Hunting accounted for 23% and collecting for 24% of losses. It was found that 30-50% of carcasses of deer dying of natural causes were located. Deer carried 40 species of parasitic worms, 20 of which were also in sheep. Nematodes had worst effects. In conjunction with poor nutrition, worms caused weakness and death of many fawns. In 1951-52, a small proportion of fawns survived their first winter but were so weakened they succumed as yearlings in following summer. Increase of worm infections is greatest in winter when soil is moist and herbaceous vegetation is green. Survivors have considerable immunity to the worms. Nutritional problem varies with season: there is protein shortage in summer and shortage of energy-building foods in winter. Sex ratio at birth was 137.5 males : 100 females. Winter losses in 1951-52 were 210 males : 100 females. Following winters were more favorable and losses were 100 males : 100 females. Tables show chronology of deer losses, reproductive rate, seasonal losses from natural causes, herd composition at various dates, and all losses of deer during study.

Longhurst, William M., and Walter E. Howard. (U. Calif. Field Sta., Hopland, Calif.) MANAGING DEER ON PRIVATE LAND. Calif. Agr. 10(5): 4, 10, 1 graph. 1956.

Calif. has had crop damage by deer in 53 of its 58 counties. The herd grows by 20-30% annually but hunters seldom take more than 5-7%. Some private lands have from 20 to more than 100 deer per sq. mi. Thousands of deer are winter-killed but the herd is still growing. Hunter pressure is growing too, but hunter success is only about 20%. The area open to hunters is dwindling. Deer control by fencing and repellents is costly and not wholly satisfactory. Range can be managed and improved most profitably when stocked with both deer and livestock. Plans for such management involve not only measures to improve the range, but measures for suitable harvests. Harvest by hunters is desirable.

Various ways are used to charge for hunting rights. One way is for the rancher to lease rights to a group for a flat fee of from $25-$100 per hunter per season. Adequate harvest seldom is achieved this way. Another system is to charge individuals for each day or for week-end. This results in more hunters, more money, but more administration. Such systems result in little damage by hunters. Shooting of both bucks and does should be done on private lands. The Calif. Fish & Game Commission has authority to permit this wherever desirable and has been attempting to do so as rapidly as public acceptance permits. A graph shows that the Calif. deer kill is only about 1/3 as large as it would be if the herd were harvested at the rate prevailing in Colo. and Utah.

Pimlott, D. H. (Dept. Resources, Newf.) SHOULD WHITE-TAILED DEER BE INTRODUCED TO NEWFOUNDLAND? Can. Dept. N. Affairs & Natl. Resources, Wildl. Mgt. Pap. Delivered at 18th Fed.-Prov. Wildl. Conf. p. 6-26. 1954.

People of Newfoundland need more meat and hunting is mainly for meat. Caribou are not generally available. Moose have not increased to the desired extent in many areas. Deer might be a great help, but would they compete with moose and caribou, and would they be too destructive to forestry and agriculture? Could adequate harvests be obtained? Data from many northern areas are brought to bear on these questions. Deer and caribou would not compete. Deer and moose would use the same winter food and habitat. Deer-moose competition seems serious on Anticosti Island but not in other Canadian areas. Deer would do more harm to forests than do moose. Deer certainly would be a problem to agriculture. The road net is thin and adequate harvests would require extremely liberal regulations as well as hunting with dogs and snowmobiles, or equivalent measures. Public opinion in Newfoundland would support such measures. Deer would have to subsist largely on balsam fir, white birch, and spruce in winter, but they have maintained high densities on such foods on Anticosti Island. The author does not announce his opinion on the desirability of introducing deer and a decision on the point does not seem simple.

Progulske, Donald R. MOVEMENTS AND HOME RANGES OF THE WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS) IN CENTRAL MISSOURI. Ph. D. thesis, U. Mo. 75 p. 1956.

Ramsey, Robert R. (Texas Game Comm.) KILL MORE DOES--HAVE MORE BUCKS. Texas Game & Fish 14(5): 4-5, 26-27, 6 figs. May 1956.

Central Texas, an area of heavily grazed ranches, has long had a deer overpopulation problem. Die-off followed die-off but the buck law held firm. Hunting of antlerless deer became legal only 1953 and then only in a small area. The area has been expanded somewhat; it covered parts of 5 counties in 1955. This paper reports on deer populations present and results of hunts. A total of 2,376 antlerless deer was legally bagged in 1955. This is only a drop in the bucket compared to the thousands that starve in summer drought and winter cold. Large areas still carry populations of 1 deer to less than 4 acres. On some heavily populated ranches, deer are in such poor condition that few bucks develop antlers enough to become legal game. Ramsey gives many figures derived from recent hunts. He explains the overpopulation and die-off situation and puts the problem into the hands of the public.

Richards, S. H., I. A. Schipper, D. F. Eveleth, and R. F. Shumard. (N. Dak. Agr. Coll.) MUCOSAL DISEASE OF DEER. Vet. Med. 51(8): 358-362. Aug. 1956.

Summary: "A disease of white-tailed deer (WTD) and mule deer with lesions and inflammation similar to mucosal disease of cattle has been observed [in N. Dak.]. Both WTD and mule deer have been necropsied and found to contain catarrhal, ulcerative, and hemorrhagic inflammation of the mucosal linings of the body. Symptomatology and behavior of sick deer is similar in many respects and different in others to MD [mucosal disease] of cattle. Experimental transmission from deer to deer, deer to antelope, and mucosal disease of cattle to deer produced similar symptoms and lesions. Further studies on etiology, infectiveness, and transmission will be conducted." [There is an extensive literature on mucosal-type diseases in cattle. See, for example, J. Am. Vet. Med. Assn. 129(3): 105-110 and 111-115 and references cited in these papers. Diseases of this type have been noted in at least 20 states and Canada. They have similarities to rinderpest and certain other exotic diseases.]

Riordan, Laurence E. SELECTIVITY AND UTILIZATION OF THREE KEY RANGE FORAGE SPECIES BY CATTLE, SHEEP AND DEER IN WESTERN COLORADO. M. S. thesis, Colo. A & M Coll. 196 p., illus. May 1956.--L. E. Yeager.

Severinghaus, C. W. (N. Y. Cons. Dept.) WINTERKILL OF DEER 1955-56. N. Y. State Cons. 11(1): 11. Aug.-Sept. 1956.

N. Y. deer experts warned for years what would happen when swollen herds on overused ranges were hit by a hard winter. Such a winter came in 1955-56. Adirondack deer were lucky: repeated formation of snow crusts permitted feeding 9-11 feet above ground. Only about 2 deer per sq. mi. starved. Crusting was less in the w. Catskills and e. central N. Y. There losses ranged from 7.9 to 110 per sq. mi. Losses would have been even heavier except for heavy either-sex hunter kills that were made the fall before in certain of the hardest-hit counties. Among deer that starved to death, adult females far outnumbered adult males. The sex ratio of fawns that starved was 100 females to 76 males.

Smith, A. D., R. B. Turner, and G. A. Harris. (Utah State Agr. Coll.) THE APPARENT DIGESTIBILITY OF LIGNIN BY MULE DEER. J. Range Mgt. 9(3): 142-145. May 1956.

"The fact that chemists skilled in the determination cannot determine lignin content accurately invalidates the lignin-ratio technique as a basis for computing the digestibilities of native forages high in woody materials... No clear inference may be drawn as to whether the apparent digestion of lignin is due to inability to isolate the material or to actual digestion. In either event the lignin-ratio technique appears to be of doubtful validity on the type of forages used." Based on direct feeding tests and chemical analysis of Utah woody range plants.

Taylor, Walter P., editor. THE DEER OF NORTH AMERICA / THE WHITE-TAILED, MULE AND BLACK-TAILED DEER, GENUS ODOCOILEUS / THEIR HISTORY AND MANAGEMENT. Stackpole Co., Harrisburg, Pa., and Wildl. Mgt. Inst., Wash. 5, D. C. xvii + 668 p., 2 col. pl., 39 photos, 21 figs. 1956. $12.50.

An encyclopedic book every wildlife library should have despite its price. Its 16 experienced authors discuss everything from reproductive cycle, nutritive needs, habitat management, life equations, habits, and taxonomy to hunting methods and care of meat.

S. P. Young discusses deer in history. R. Kellogg reviews the 30 ssp. of whitetails. C. W. Severinghaus and E. L. Cheatum contribute a valuable monograph on whitetail biology. N. W. Hosley presents a long, informative section on managing whitetails and their habitats. H. D. Ruhl has a lengthy, interesting section on hunting whitetails. I. McT. Cowan, drawing on his earlier revision, gives a usefully detailed treatment of taxonomy, identification, and distribution of mule and blacktail deer. He also contributes a monographic report on biology and management of blacktails of the Pacific Coast. A. S. Einarsen tells of the habits and life history of mule deer. R. R. Hill discusses foods and range management for mule deer. W. L. Robinette analyzes productivity of mule deer in relation to management. R. McCain and W. P. Taylor cover the many methods used in estimating numbers of mule deer. G. N. Hunter, L. E. Yeager, and A. S. Einarsen take up a multitude of topics pertaining to mule-deer management. J. W. Spencer provides a long chapter on hunting mule deer; this chapter, with Ruhl's, should appeal to hunters who find the rest of the book too technically oriented for them although simply enough written.

It was impossible, of course, to discuss the herds and management problems of each area, but enough information of this type is included to give solidity; the book is far more than just an exposition of principles and problems. Apparently, however, it was infeasible to compile an adequate treatment of the vexing question of local weights; this weakness is acute for the whitetails. The book is well documented. The list of references cited occupies 32 pages and a few of the references appeared as recently as 1955.

Thomas, D. Woods, and Jerome K. Pasto. (Pa. State U.) COSTS AND BENEFITS OF THE DEER HERD / AN ECONOMIC ANALYSIS OF DEER MANAGEMENT IN TWO PENNSYLVANIA COUNTIES. Pa. State U., Agr. Exp. Sta., Bul. 610. 1-33 p., illus. Mar. 1956.

Discusses methodology and conceptual framework of the economic survey and proceeds to discuss crop damage by deer, property damage by hunters, value of deer killed, and expenditures by hunters. Hunters and business men benefit, of

course, from the herd. Farmers, on the whole, lose more than they gain from deer, and would profit from herd reduction. Few farmers, however, would care to see deer eliminated. "In the case of overabundant deer, the net social product is reduced by the amount that the damage to farm crops exceeds the added recreational value obtained from the excess deer. If a herd that is too large has no greater recreational value than a smaller herd, then all crop damage must be considered a net loss to society. Likewise, a herd smaller than the available habitat will support would make it impossible for some groups to obtain their maximum returns. When there is proper balance, however, the welfare of society would be maximized."

Webb, Wm. L., R. T. King, and E. F. Patric. (State U. of N. Y., Coll. For., Syracuse.) EFFECT OF WHITE-TAILED DEER ON A MATURE NORTHERN HARDWOOD FOREST. J. For. 54(6): 391-398, 11 graphs. June 1956.

Two deerproof exclosures, each of 2.1 acres, were created in 1939 on the Huntington Wildlife Forest near Newcomb, N. Y. Deer population was not controlled; it varied from 19 to 35 acres per deer in the period of study. This paper is a detailed report of condition of many kinds of plants inside and outside of exclosures. Different species reacted differently under deer pressure, but the general conclusion is: "After 15 years of protection it can only be concluded that deer are not an important limiting factor in the establishment of any tree, shrub or herbaceous species in this uncut mature northern hardwood forest. The effect of deer can be measured after 15 years, but the differences are so small as to be unimportant in the management..."

Wislocki, George B. (Harvard Med. Sch., Boston.) FURTHER NOTES ON ANTLERS IN FEMALE DEER OF THE GENUS ODOCOILEUS. J. Mamm. 37(2): 231-235, 1 pl. May 1956.

Three female deer, apparently fertile, possessed small, abnormal antlers. A 4th deer appeared to be an hermaphrodite. It possessed polished antlers of normal form, female external genitalia and a vagina, but internally a cryptorchid testis.

MAMMALS--MARINE

Chiasson, Robert Breton. THE MORPHOLOGY OF THE ALASKAN FUR SEAL. Ph. D. thesis, Stanford U. 122 p. 1956. [From Dissertation Abstracts 16(4).]

"The principal aim of this study has been to present a general anatomical description of the fur seal...and to determine, so far as possible, the phylogenetic status of the Pinnipedia. Comparisons are made to published descriptions of various mammals. The adaptations of pinnipeds to the aquatic environment are re-examined and some of the changes during growth in these animals are recorded... The conclusions which have been reached are: 1) The Pinnipedia constitute an order of mammals separate and distinct from all other orders of mammals. 2) The pinnipeds are derived from an herbivorous ancestor which probably lived in the early Tertiary."

Eibl-Eibesfeldt, Irenäus. (Max-Planck-Inst., Buldern, Westfalen, Germany.) BEOBACHTUNGEN ÜBER TERRITORIALES VERHALTEN UND BRUTPFLEGE DES GALÁPAGOS-SEELÖWEN. Z. Säugetierk. 20(2/3): 75-77. Aug. 1955. [From J. Mamm. 37(2).]

Jonsgård, Åge. THE STOCKS OF BLUE WHALES (BALAENOPTERA MUSCULUS) IN THE NORTHERN ATLANTIC OCEAN AND AJACENT ARCTIC WATERS. Norsk Hvalfangst-Tidende 44 (9): 505-519. Sept. 1955. [From J. Mamm. 37(2).]

Kenyon, Karl W. (US F&WS, 8923 236th S.W., Edmonds, Wash.) THE CIRCUS SEAL AT HOME. Nat. Hist. 65(4): 196-201, 8 photos. Apr. 1956.

Natural history of Calif. sea lion. Takes up habits, conservation status, economics, numbers, range, etc., in popular fashion. There are now over 5,000 in Calif. waters and they are still increasing. They are protected except when actively interfering with fishery activities. They are practically harmless in food habits, but they can do great damage to fishing gear. Breeding is by small harems. A cow has 1 young a year. Contrary to some statements, young require no swimming lessons. Captives may live about 20 years. Wild sea lions are heavily parasitized and prone to stomach ulcers, which are favorite sites for parasite attachment.

Kenyon, Karl W. (US F&WS, Edmonds, Wash.) FOOD OF FUR SEALS TAKEN ON ST. PAUL ISLAND, ALASKA, 1954. J. Wildl. Mgt. 20(2): 214-215. Apr. 1956.
Of 50,239 immature males harvested, about 27 had food in stomach. Sand fish (Trichodon trichodon) was chief food. Sea poacher (Agonus acipenserinus) made up 5.6% of food by volume. Cod and squid appeared as traces. The picture given by this sample is different from that obtained from spewings on rookeries. Study of pelagically collected stomachs is also necessary to complete knowledge of fur-seal food habits near Pribilofs.

Laws, R. M. (Natl. Inst. Oceanog., Wormley, Surrey, Eng.) GROWTH AND SEXUAL MATURITY IN AQUATIC MAMMALS. Nature 178(4526): 193-194, 1 graph. July 28, 1956.
Published data on average lengths of females at puberty and maturity are analyzed for 11 species of cetaceans and 12 of pinnipeds. Relationship of length at puberty to length at physical maturity is remarkably constant. It averages 85.1% (80.0-88.5%) in cetaceans and 86.6% (80.8-92.3%) in pinnipeds. When percentage increase in length in first year is plotted against average age at sexual maturity, it is found that slower-growing species take longer to attain 86% of their final length and hence that they mature later than precocious species. Length at birth reflects rate of growth and is related to age at puberty. Similar rules hold for males, but are not so constant, owing to great variation in growth rates. In general, male seals and whales tend to become sexually mature at greater ages than females. "If this relation between the rate of growth and the age of puberty proves to be a general rule, then it should be possible to predict the age at sexual maturity from the growth-rate, or vice versa." For this and other reasons, it is likely that sexual maturity in Phoca vitulina is attained at age of 5-6 years rather than the 3 years generally stated.

Omura, Hideo. WHALES IN THE NORTHERN PART OF THE NORTH PACIFIC. Norsk Hvalfangst-Tidende 44(6): 323-343, and 44(7): 395-405, illus. June and July 1955. [From J. Mamm. 37(2).]

Schevill, Wm. E., and Barbara Lawrence. (Woods Hole Oceanog. Inst., Mass.) FOOD-FINDING BY A CAPTIVE PORPOISE (TURSIOPS TRUNCATUS). Breviora (Mus. Comp. Zool., Harvard U.) no. 53. 1-15 p. Apr. 1956.
Experimental evidence that echolocation is one of the major means of locating food.

Schubert, Kurt. DER WALFANG DER GEGENWART [WHALING AT THE PRESENT TIME]. Handbuch der Seefischerei Nordeuropas (Stuttgart) 11(6): iv + 206, 114 figs. 1955.
A large monograph that has numerous tables and an extensive bibliography. The first chapter (44 pages) is on whale biology. It takes up such topics as systematics, organ systems, reproduction, weight, age, growth, foods, diseases, and travels. The second chapter is on international whaling regulations. An appendix is also devoted to these. Other chapters cover a variety of whale fisheries and modern technology in capturing and processing whales. One chapter is on the history of modern whaling in Germany. A great many whaling statistics are given. The book appears to treat almost all aspects of whaling all over the world. Despite the name of the series in which this monograph appeared, scope of the book is by no means limited to Europe.

Sleptsov, M. M. BIOLOGY AND WHALING IN THE SEAS OF THE FAR EAST. Food Industry Publ. House, Moscow. 64 p., illus. 1955. [From J. Mamm. 37(2).]
In Russian.

Sleptsov, M. M. CETACEANS OF THE SEAS OF THE FAR EAST. Pac. Res. Inst. Fish. & Oceanog., Min. Fish. USSR, Vladivostok. 162 p., illus. 1955. [From J. Mamm. 37(2).]
In Russian.

MAMMALS--OTHER GROUPS

Kebbe, Chester E. (Portland, Ore.) STATUS OF THE OPOSSUM IN OREGON. Murrelet 36(3): 42. Sept.-Dec. 1955 [May 1956].
The introduced colony in Umatilla Co. (ne. Ore.) died out, probably in the 1930's. Most other opossum plants also failed in Ore. But a group liberated by CCC boys at Warrenton, Clatsop Co., found the mild, moist climate of nw. Ore. favorable and spread and increased rapidly. Opossums have been taken at least 50 mi. in all directions from Warrenton. Many are seen dead on roads and trappers accidentally catch a few score each year. Pelts bring around 15-30¢.

BIRDS--GENERAL

Blake, Charles H. (Mass. Inst. Tech.) LEG SIZES AND BAND SIZES: SECOND REPORT. Bird-Banding 27(2): 76-82. Apr. 1956.
Careful study of leg diameters of small birds of e. U. S. and of sizes of bands required for these birds.

Stephens, T. C. AN ANNOTATED BIBLIOGRAPHY OF NORTH DAKOTA ORNITHOLOGY. Nebr. Ornith. Union, Occ. Pap. no. 2. iv + 22 p. 1956. $1.00 from Dr. W. F. Rapp, Jr., 430 Ivy Ave., Crete, Nebr. [From review by F. J. P., Iowa Bird Life 26(2).]
The 267 titles included in this work range in date from 1858 through 1947.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Acworth, Bernard. BIRD AND BUTTERFLY MYSTERIES / THE TRUTH ABOUT MIGRATION. Philosophical Library, N. Y. 16, N. Y. 303 p., 12 figs., 2 plates. 1956. $7.50.
A serious, controversial book. It is a combination of at least 2 works published some years ago and now brought together with additions. One of the author's main purposes is to explain the nature of air movements and their effects on winged animals. According to Acworth, ornithologists and entomologists have been naively ignorant of physical facts about air currents in relation to flight, distribution, and migration. Here pertinent facts about winds are detailed for biologists; the ideas expressed are said to meet with the approval of physicists and mathematicians. Another section of interest is the examination of facts and theories about the cuckoo; Acworth proposes the theory that the cuckoo is a hybrid--that cuckoo eggs are laid by the foster mother after mating with a cuckoo, whose heredity is dominant. The book is also a vehicle for the author's strictly fundamentalist and anti-evolutionist views. The idea that birds have anything that could be called "mind" is demolished in favor of purely instinctive, mechanical behavior. Instinct, in turn, is defined "as the necessity of acting reasonably, and therefore of obeying, absolutely, the will of its Creator..." A wide selection of biological work is reviewed and credited to its authors for the purpose of belaboring the authors or for sustaining Acworth's own concepts. An old statement of Bateson's, for example, is quoted quite out of scientific perspective to show that there is no genetic basis for evolution. This sort of thing should not blind us to the fact that the chapters on winds may contain important information for those who are able to appraise it.

Altmann, Stuart A. (Harvard U.) AVIAN MOBBING BEHAVIOR AND PREDATOR RECOGNITION. Condor 58(4): 214-253, 2 figs. July-Aug. 1956.
Describes and discusses experiments in which stuffed owls of various species were exposed in the field to mobbing by numerous species of small birds. Basis of mobbing behavior is considered.

Bergstrom, E. Alexander, and William H. Drury, Jr. (37 Old Brook Rd., W. Hartford 7, Conn.) MIGRATION SAMPLING BY TRAPPING: A BRIEF REVIEW. Bird-Banding 27(3): 107-120. July 1956.
Summary: "Methods, other than traps or nets, for sampling passerine migrants are discussed briefly. They include sight observation, telescope observation of birds crossing the moon, and birds picked up dead at high buildings. A general discussion of the relative advantages of traps and Japanese mist nets suggests that the nets are far more effective. The number of distant recoveries of birds netted on migration is not likely to justify the labor of banding, but a wide variety of data recorded at the time of banding can be used to great effect without further captures of the individual bird."

Dilger, William C. (Cornell U.) HOSTILE BEHAVIOR AND REPRODUCTIVE ISOLATING MECHANISMS IN THE AVIAN GENERA CATHARUS AND HYLOCICHLA. Auk 73(3): 313-353, 8 figs., 1 pl. July 1956.

Summary: "A comparative study was conducted on the hostile behavior of [veery, hermit thrush, olive-backed thrush, gray-cheeked thrush, and wood thrush]. These behavior patterns are described and evaluated. The hostile behavior patterns of H. mustelina are quite different from those of the four species of Catharus. These latter hostile behavior patterns, excepting vocalizations, are similar to one another. Experiments conducted with tape recordings of the hostile vocalizations and models of the various species provided most of the data utilized. It is suggested that the principal reproductive isolating mechanisms, preventing mixed pairings among these species, are the species specific vocalizations of the males (advertising song) acting as sign stimuli to the corresponding specific releasing mechanisms of the females. Minor differences of plumage pattern, color, and movement probably play roles fortifying the initial choice."

Engels, Wm. L., and Charles E. Jenner. (U. of N. C.) THE EFFECT OF TEMPERATURE ON TESTICULAR RECRUDESCENCE IN JUNCOS AT DIFFERENT PHOTOPERIODS. Biol. Bul. 110(2): 129-137. Apr. 1956.

Odum, E. P., and C. E. Connell. (U. Ga.) LIPID LEVELS IN MIGRATING BIRDS. Science 123(3203): 892-894. May 18, 1956.

Odum, Eugene P., and James C. Major. (U. Ga.) THE EFFECT OF DIET ON PHOTOPERIOD-INDUCED LIPID DEPOSITION IN THE WHITE-THROATED SPARROW. Condor 58 (3): 222-228, 2 graphs. May-June 1956.

Otterlind, Gunnar. MIGRATION AND DISTRIBUTION. A STUDY OF THE RECENT IMMIGRATION AND DISPERSAL OF THE SCANDINAVIAN AVIFAUNA. Vår Fågelvärld 13: 1-13, 83-113, 147-167, 245-261. 1954. [From long review by Louise de K. Lawrence, Auk 73(2).]

Has detailed English summary. A significant work on the many factors that affect migration and dispersal. Includes many stimulating suggestions and deductions.

Raynor, Gilbert S. (Brookhaven Natl. Lab., Upton, N. Y.) METEOROLOGICAL VARIABLES AND THE NORTHWARD MOVEMENT OF NOCTURNAL LAND BIRD MIGRANTS. Auk 73(2): 153-175, 5 figs. Apr. 1956.

Conclusions: "Of the various meteorological variables studied, only two, atmospheric stability and wind direction, give a good correlation with springtime nocturnal landbird migration. The two together give a better correlation than either separately, but stability seems somewhat more important than wind direction. Therefore, it is evident that such migration normally takes place with favorable winds in stable air which may be caused either by ground or frontal inversions but may continue above frontal inversions. Migration is probably initiated by changes in temperature or wind structure or both, and these act as stimuli to the migrant. Migratory flights are often terminated at the edge of an unstable area or a region of unfavorable winds. A number of previously puzzling migration problems may be explainable on the basis of these findings."

Vleugel, D. A. THE POSSIBILITY OF SUN ORIENTATION OF SOME SPECIES IN MIGRATION. Ornis Fennica 30(2): 41-51. 1953. [From abstract by D. S. Farner, Bird-Banding 27(3).]

In German. "This paper contains some interesting reflections on possible schemes of sun orientation in migration. It is assumed that, in many species, the direction of flight is set by a horizontal angle with the sun at sunrise. This is considered in conjunction with the earlier temporal-symmetry...concepts of Corti and Stimmelmayr." Farner's abstract provides further details.

Vleugel, D. A. THE PREFERENCE FOR HEADWIND BY MIGRATING CHAFFINCHES. Le Gerfaut 44(3): 259-277. 1954. [From abstract by D. S. Farner, Bird-Banding 27(3).]

In Dutch. "Whenever meteorologic conditions were favorable, fall migration in 1943 was observed to be about seven times as intense under conditions of mild head winds as under mild tail winds. The difference between weak head and tail

winds was less pronounced. In the springs of 1934 and 1953 in eastern Netherlands migration was 2.5 times as intense during periods of moderate or weak head winds as in moderate or weak tail winds. That fall migration occurs frequently by steady movement on a broad front can be explained by the fact that this occurs when head winds are the rule. In spring such well developed broad-front movements are noted less frequently, an observation which the author correlates with a greater frequency of tail winds. It is the author's suggestion the Chaffinches may navigate by maintaining a certain angle with the prevailing wind and that such an angle is easier to maintain with a head wind; this is suggested as possible explanation for the apparent preference for migration into a head wind. It is suggested that the greater tail-wind migration in spring may be explained by the fact that more of the birds are familiar with the terrain and that sun orientation is easier in spring than in fall."

Vleugel, D. A. THE INADEQUACY OF VISUAL ORIENTATION FOR STRAIGHT FLIGHT, ESPECIALLY IN THE MIGRATION OF THE CHAFFINCH. Ornis Fennica 32(2): 33-40. 1955. [From abstract by D. S. Farner, Bird-Banding 27(3).]

In German. "The author presents a number of arguments based on field observations, to the effect that orientation with overcast skies cannot be explained alone by visual orientation to fixed points. It is suggested that, whereas such orientation may be important over short distances, orientation by maintaining a constant angle with wind direction may be important over greater distances."

von Saint-Paul, Ursula. (Max Planck-Inst., Wilhelmshaven, Ger.) COMPASS DIRECTIONAL TRAINING OF WESTERN MEADOWLARKS (STURNELLA NEGLECTA). Auk 73(2): 203-210, 4 figs. Apr. 1956.

Birds were trained to seek food in a given compass direction. The possibility was eliminated that they might use landmarks other than the sun. Birds were disoriented on overcast days. Tests were made when the sun's position was different from that in the training period. Two individuals selected the compass direction independently of time of day. One of 5 usually chose on the basis of the sun's actual position, not allowing for the sun's movement. "The results of this study give further support to the supposition that the ability of true azimuth orientation, where the sun's azimuth position and time of day are the necessary requirements, is general among birds."

Wallgren, Henrik. ENERGY METABOLISM OF TWO SPECIES OF THE GENUS EMBERIZA AS CORRELATED WITH DISTRIBUTION AND MIGRATION. Acta Zool. Fennica 84: 1-110. 1954. [From long abstract by D. S. Farner, Bird-Banding 27(2).]

Farner's informative abstract terms this paper a very important monograph.

Wallgren, Henrik. BIRD MIGRATION AS AN ADAPTATION PHENOMENON. Die Vogelwarte 18(2): 61-66. 1955. [From abstract by D. S. Farner, Bird-Banding 27(3).]

In German. "The Yellow Bunting (Emberiza citrinella) was shown experimentally to have much greater cold tolerance and a slightly lesser heat tolerance than the Ortolan Bunting (E. hortulana). The better cold tolerance of the latter [sic] apparently is to be attributed to its denser plumage since no differences in metabolic rate and body temperature could be demonstrated. Climographs show clearly that migration would give little advantage to the Yellow Bunting whereas it is essential to the Ortolan Bunting. Fat deposition in the Ortolan Bunting is not the result of reduced metabolic rate; early fall migration probably has positive selective value since the fat deposition (or at least the favorable energy balance which causes it) which is necessary for migration can occur only before higher thermo-regulatory requirements of lower temperatures and decreased food intake of shorter days eliminate the favorable balance."

Weise, Charles Martin. AN EXPERIMENTAL STUDY OF THE ROLE OF THE GONADS IN THE ANNUAL STIMULUS FOR BIRD MIGRATION. Ph. D. thesis, U. Ill. 134 p. 1956. [From long abstract in Dissertation Abstracts 16(5).]

Weise, Charles M. (Fisk U.) NIGHTLY UNREST IN CAGED MIGRATORY SPARROWS UNDER OUTDOOR CONDITIONS. Ecol. 37(2): 274-287, 6 figs. Apr. 1956.

Study of factors that influence tendency to migrate.

Wood-Gush, D. G. M. THE BEHAVIOUR OF THE DOMESTIC CHICKEN: A REVIEW OF THE LITERATURE. Brit. J. Anim. Behaviour 3(3): 81-110. 1955. [From notice by M. M. Nice, Bird-Banding 27(3).]

"An excellent, well-documented resumé of the voluminous studies on this bird from embryo to old age." Should be of considerable comparative and bibliographic value.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Anon. CHECKLIST OF SOUTH DAKOTA BIRDS. S. Dak. Bird Notes 8(1): 13-19, map. Mar. 1956.

Indicates status of each species in each of 6 regions of state. Separate lists cover accidentals and species that no longer occur in S. Dak.

Bond, J. CHECK-LIST OF BIRDS OF THE WEST INDIES. 4th ed. Philadelphia Acad. Nat. Sci. ix + 214 p. 1956. [From notice by R. W. S., Auk 73(3).]

"A bringing up to date of this familiar work. See Auk 53: 105, 1936, and 62: 318, 1945, for reviews of the first and second editions, respectively."

Buss, Irven O., and Helmer M. Mattison. A HALF CENTURY OF CHANGE IN BIRD POPULATIONS OF THE LOWER CHIPPEWA RIVER, WISCONSIN. Milwaukee Pub. Mus., Publ. in Ornith. no. 1. 1-319 p., 26 figs. 1955. $5.00.

Toward the end of the 19th century, J. N. Clark observed and collected birds and their eggs in w.-cent. Wis. The authors have integrated his notes and specimen data with extensive recent data obtained by themselves and associates. The result is a worthwhile ornithology of Dunn Co. and adjacent areas. Most of the book consists of an annotated list. A typical species account consists of notes on present status and any apparent change in status, a few observations on natural history and migration, lists of specimen and sight records, and statement of applicable subspecific name. Game birds are given special attention. Good information is provided on long-term population fluctuations of whistling swan, ruffed grouse, prairie chicken, and sharptailed grouse. Seasonal population changes of waterfowl species are given much attention, with graphs. Bobwhite fluctuations, and wildlife research on the species, are described. Pheasants are discussed in respect to fluctuations, sex ratios, and results of stocking. Many data are given on breeding phenology of robin. Following the annotated list is a hypothetical list. One substantial section analyzes waterfowl hunting records. It gives details on species composition of bags, hunting statistics, and cripple losses. "Burn-out" of wood ducks is stressed. One valuable section lists weights and measurements of more than 500 individual birds, including many game birds. A bibliography of 78 references and a good index complete the volume.

Caswell, Herbert Hall, Jr. THE APPLICATION OF MEASURES OF ASSOCIATION TO ANALYSIS OF ECOLOGICAL RELATIONSHIPS AMONG BIRDS. Ph. D. thesis, Cornell U. 108 p. 1956. [From long abstract in Dissertation Abstracts 16(4).]

"Methods are derived for using patterns of association in an array of such coefficients as a basis for inference about ecological interactions among the species considered. These methods include multiple factor analysis, rank correlation coefficients as coefficients of ecological communality, graphical methods, and partial association. The technique is applied to twenty-nine species of land birds of Eastern North America. The coefficients of association between species pairs and between each species and each of six latitudinal zones, six habitat types, and six degrees of total breeding bird density (as an indication of richness of habitat) are computed from data in 417 censuses of breeding birds. The censuses, mostly compiled from the literature, were taken after the breeding range of the Starling...had encompassed the census area." Much attention is given to association and competition between starlings and several other species. Competitive relationships between starling, bluebird, flicker, red-headed woodpecker, and English sparrow are discussed.

BIRDS--MANUALS, FAUNAS, COMMUNITIES--Continued

Eisenmann, Eugene. THE SPECIES OF MIDDLE AMERICAN BIRDS. Trans. Linn. Soc. N. Y., vol. VII. vi + 128 p. 1955. $2.00. [From abstract by H. H. Poor, Bird-Banding 27(2).]

"A list of the 1,424 bird species recorded from Mexico to Panama, grouped according to order and family. The technical name, preferred vernacular name, and a brief statement of range are given for each species; subspecies are not treated. A twelve-page classified and annotated bibliography of the important English language literature of Middle American ornithology is included." The author attempts to standardize the vernacular nomenclature by selecting or bestowing a single common name for each species.

Martin, Norman Duncan. AN ANALYSIS OF BIRD POPULATIONS IN RELATION TO PLANT SUCCESSION IN ALGONQUIN PARK, ONTARIO. Ph. D. thesis, U. Ill. 382 p. 1956. [From abstract in Dissertation Abstracts 16(5).]

Describes forest successions on wet and dry sites and reports results of bird censuses made on study plots situated in a variety of habitats.

Parkes, K. C. (Carnegie Mus., Pittsburgh.) A FIELD LIST OF BIRDS OF THE PITTSBURGH REGION. Carnegie Mus., Pittsburgh, Pa. 48 p. 1956. [From notice by R. W. S., Auk 73(3).]

"Information on distribution, abundance, and seasonal occurrence presented graphically. Maps of the area and selected references to works on birds of the region add to its usefulness."

Steel, Paul E., Paul D. Dalke, and Elwood G. Bizeau. (U. Idaho.) ANNOTATED LIST OF THE AVIFAUNA IN AND AROUND GRAY'S LAKE, IDAHO. Murrelet 37(1): 4-10. Jan.-Apr. 1956.

Describes area and gives data on status and spring arrival dates of 145 species of birds.

Wolfe, L. R. CHECK-LIST OF THE BIRDS OF TEXAS. Intelligencer Printing Co., Lancaster, Pa. 89 p., 1 map. 1956. $1.75. [From review by R. W. S., Auk 73(3).]

"This first list of the birds of Texas since 1912 will prove very useful... The species and subspecies accounts are brief, averaging eight per page, and include short statements of seasonal status, abundance, and range. The last is in terms of the eight areas into which the Texas Ornithological Society has divided the state. Col. Wolfe wisely used vernacular names only for species and was conservative in selecting the records included. The resulting work should be valuable for many years."

Yapp, W. B. A CLASSIFICATION OF THE HABITATS OF BRITISH BIRDS. Bird Study 2: 111-121. 1955. [From abstract by L. McC., Ibis 98(2).]

"A new comprehensive classification of the habitats of British birds, using a method of continuous subdivision and based on the vegetational background."

BIRDS--POPULATIONS & FLUCTUATIONS

Anon. "SUPER-STIMULATION." N. Y. State Cons. 11(1): 36. Aug.-Sept. 1956.

According to the N. Y. Times, the British found that provision of extra nesting boxes (superstimulation) caused extension of range and population of pied flycatcher. German ornithologists, interested in control of forest insects, figured that if a few nests helped a little, more nests should help a lot. "Selecting a 61-acre 'insect infested' birch-pine forest area near Frankfort, they installed more than 1,000 nest boxes, bags and bowers woven out of pine branches. Before this avian housing development got under way, the bird population in the area was three pairs to each two and one-half acres. Within a year following installation of the bird houses, the figure had risen to 24 pairs and eventually the bird population climbed to 44 pairs per each two- and one-half-acre unit of area." [Nearly complete.]

Austin, Oliver L., and Oliver L. Austin, Jr. (N. Eastham, Cape Cod, Mass.) SOME DEMOGRAPHIC ASPECTS OF THE CAPE COD POPULATION OF COMMON TERNS (STERNA HIRUNDO). Bird-Banding 27(2): 55-66, 4 graphs. Apr. 1956.

Summary: "The reproductive backbone of the Cape Cod population of Common Terns is composed of birds from 3 to 10 years old. These comprise 90 percent of the breeding population. Birds less than 3 years old comprise only 3.4 percent of the breeding colonies, birds more than 10 years old less than 7 percent. Though individuals do attain greater ages, the maximum reproductive life-span of the Common Tern appears to be about 20 years. The mean annual mortality of the breeding population is constant at 25 percent from the 4th through the 18th years. The steady increase in the annual mortality rate after the 18th year suggests the onset of old age in the 19th year. If the population is to maintain itself, at least 20 percent of the young fledged to banding age must survive to breed at the age of 4 years. The first year mortality appears to be between 60 and 70 percent. The 2nd and 3rd year mortalities are probably considerably lower than the 25 percent shown by the breeding population."

Coulson, J. C., and E. White. (U. Durham, Eng.) A STUDY OF COLONIES OF THE KITTIWAKE RISSA TRIDACTYLA (L.). Ibis 98(1): 63-79, 8 figs. Jan. 1956. [From abstract by R. F. J., Auk 73(3).]

"An examination of the hypothesis that in colonial birds large colonies breed earlier than small colonies (the 'Fraser Darling Effect'). The authors show that it is age rather than any social facilitation that is involved: large colonies are older colonies, they have more older birds, and older birds breed earlier in the year than younger birds."

Dixon, Keith L. (Texas A & M Coll.) TERRITORIALITY AND SURVIVAL IN THE PLAIN TITMOUSE. Condor 58(3): 169-182, 4 figs. May-June 1956.

Territories remained fairly stable during 6 years of study. When territories became vacant, neighbors tended not to expand into them. Adults defended their areas against juveniles even after breeding season. Territorial activities were conspicuous in late winter and spring, but expansion of territories was seldom attempted. Established individuals had annual survival of about 75%. Annual mortality of adults was 24%. "Correspondingly, reproductive rate is lowered and a direct causal relationship between adult survival and year-around territoriality by paired birds is inferred." Young must seek new areas and thereby constitute a pool of replacements. The study suggests that, contrary to some opinions, territoriality may limit population density.

Goodpasture, Katherine A. (408 Fairfax Ave., Nashville 12, Tenn.) RECOVERY OF A CHICKADEE POPULATION FROM THE 1951 ICE STORM. Migrant 26(2): 21-23. June 1955. [Abstract by Mrs. M. M. Nice, Bird-Banding 27(2).]

"On 16 trips along a 5-mile country road in middle Tennessee from Nov. 15, 1950 to Jan. 27, 1951, Carolina Chickadees, Parus carolinensis, were recorded on every trip, the highest counts being 13, 18 and 31, the average 9.37. From Jan. 28 to Feb. 1 temperatures fell to 13 to 20 degrees Fahrenheit below zero and thick ice encased every twig, limb and tree trunk. On 18 trips from Feb. 2 to Mar. 8 not a single chickadee was seen. On Mar. 11 there was one and on the 25th two. It was not until the fourth breeding season after the blizzard that a breeding population was reestablished, and then it was only about half the size of the pre-storm level."

Johnston, Richard F. (N. M. A & M Coll.) POPULATION STRUCTURE IN SALT MARSH SONG SPARROWS. PART II. DENSITY, AGE STRUCTURE, AND MAINTENANCE. Condor 58(4): 254-272, 5 figs. July-Aug. 1956.

From summary: "Song Sparrows in a year of medium density existed at about one pair per acre. Along the sloughs, where the birds spend all their time, the density runs from 6 to 10 pairs per acre, depending on the absolute number of birds on the marsh and the complexity of the vegetation available to them. Shifts in density were minor; the largest was a 24 per cent increase in 1953 over 1952. Density was found to vary directly as the preceding year's productivity. Natality rates varied from 7.5 to 9.1 total eggs per pair per season; these figures are not correlated with clutch-size or productivity. Mortality rates vary from 56 per cent in the first three weeks, to about 80 to 85 per cent in the period of the third to the fifty-second week, to 43 per cent per year for adult birds. A life table is presented. The chances are better than even

that if a bird survives to the age of one month it will have at least one sibling also surviving to that age. Clutch-size is not related to survivorship. Productivity varied from 2.0 to 5.8 fledglings per pair per season. Mortality factors for Song Sparrows include rodent predation, high tide water, death of or desertion by the adults, infertility and embryonic death, and storms. Predation, tidal floods, and desertion cause about 80 per cent of the total mortality to eggs and nestlings."

Kolb, Haven, editor. WINTER BIRD-POPULATION STUDY. Aud. Field Notes 10(3): 285-304. June 1956.
Reports 42 studies of winter bird populations in many habitats and various parts of the nation. These population studies should not be confused with the Christmas Count.

Richards, Tudor. (Concord, N. H.) OUR CHANGING BIRD LIFE. N. H. Bird News 7(1): 3-16, Jan. 1954; 8(2): 43-52, Apr. 1955; 9(2): 34-38, Apr. 1956.
"A brief summary of the more important changes in status that have occurred among the birds of New Hampshire in the last three-hundred and thirty years." Part I tells of changes that accompanied the drastic alterations of habitats in days of settlement and those that came with abandonment of farms and increased logging. It also gives considerable information on market hunting and its effects. Part II, which deals with the period 1900-55, opens with a short discussion of effects of better laws and law enforcement and mentions recent trends in land use. It then begins a group-by-group discussion of changes in status of species. Water birds, including waterfowl, are covered in this part. Part III is a continuation of Part II. It covers the groups from hawks through passerines, including upland game birds. It also contains a summary of the series. In general, changes since 1900 have been highly favorable, especially for water birds, although some land birds have been affected adversely by recent habitat changes.

Turček, František J. BIRD POPULATIONS OF THREE TYPES OF FOREST COMMUNITIES IN SLOVAKIA. Biológia 10(3): 293-308. 1955. [From abstract by Mrs. M. M. Nice, Bird-Banding 27(2).]
"In Czech with English summary. The number of individuals per hectare and the weight of their biomass for the different forest types proved to be: in oak-hornbeam at 200-250 meters, 19-20 birds totalling 1,000-1,650 grams; in oak-beech at 450-500 meters, 11-15 birds weighing 550-700 grams; and in fir-beech at 1,000-1,300 meters, 'about 16 birds or 1,050 biomass.' 'The qualitative structure is given in the list of species, while the quantitative one is presented in table 5. The numerical and biomass dominance of the particular food-groups and species, respectively, is analysed in table 6 and 7 respectively. The stratigraphy of the bird population is tabulated in table 8, while the seasonal aspect of species distribution in particular types and food-groups is given in table 9.' Very interesting work."

BIRDS--CONTROL, MORTALITY

Axell, H. E. PREDATION AND PROTECTION AT DUNGENESS BIRD PRESERVE. Brit. Birds 49(6): 193-212. June 1956.
Detailed account of steps taken to protect an endangered breeding colony of gulls and terns from predation and disturbance by man, other mammals, and birds.

Dow, Robert L. (Me. Dept. Sea Fisheries.) THE HERRING GULL-CORMORANT CONTROL PROGRAM STATE OF MAINE 1953. State of Me. Dept. Sea & Shore Fisheries, Gen. Bul. no. 1. 1-26 p., mimeo. Aug. 1953 (Revised).
Control was by spraying eggs with an emulsion. This apparently was satisfactory for gulls but less so for cormorants. Control of cormorants varied from about 50% to nearly 100%. Spraying was done when reconnaissance showed that many eggs had been laid. It is recommended: that economic effect of cormorant be studied to see if control is justified, that cormorant natural history be studied, that various control measures be evaluated, and that, for the time being, cormorant control be done only on experimental basis. Minimum estimates of herring gull and cormorant populations in Me. are presented. Most of the report consists of tables.

Harrison, J. M. FISH AND OTHER AQUATIC FAUNA AS PREDATORS OF BIRDS. Bul. Brit. Ornith. Cl. 75: 110-113. 1955. [From abstract by R. E. M., Ibis 98(2).]
"Summarizes published records and adds personal records of a number of injuries attributed to marine animals."

Mann, Wm. F., Jr., H. J. Derr, and Brooke Meanley. (S. For. Exp. Sta., New Orleans 13, La.) BIRD REPELLENTS FOR DIRECT SEEDING LONGLEAF PINE. Forests & People (1104 6th St., Alexandria, La.) 6(3): 16-17, 48. 3rd quarter 1956.
Morkit has been withdrawn from the Am. market and a substitute, also based on crude anthraquinone, put out by the holder of Am. patent rights, has not been tested. Sublimed synthetic anthraquinone and crude anthraquinone both did well in tests reported here. Neither will be available unless licensing agreements are consumated. None of these compounds repels rodents. Arasan Seed Disinfectant and Protectant (50% tetramethyl thiuram disulphide) used at 15% level effectively protects seeds from both birds and rodents and is recommended. It is irritating to eyes, nose, and throat. It is harmful to stratified seed of loblolly and slash pine. Whether it affects unstratified seed is unknown. The producer is replacing this compound with a similar one that has not yet been tested by the authors, but good supplies of the 50% Arasan remain in stock. "Arasan Seed Disinfectant and Protectant...should not be confused with other 'Arasan' products, of which there are several. Some of these are known to reduce germination of some species of pine seed, and others are as yet untested."

Meanley, Brooke, W. F. Mann, Jr., and H. J. Derr. NEW BIRD REPELLENTS FOR LONGLEAF SEED. US For. Serv., S. For. Exp. Sta. (New Orleans 13, La.), S. For. Notes no. 105. p. 1-2. Sept. 1956.
Morkit, a good bird repellent, has been withdrawn from the U. S. market. Fortunately, recent tests show that Arasan Seed Disinfectant and Protectant is as good or better. This compound (50% tetramethyl thiuram disulphide) gave somewhat better results in field tests than either Morkit or crude anthraquinone. The latter cannot be sold as a bird repellent until licensing negotiations are completed. Observations in all tests indicated that Arasan has rodent-repellent as well as bird-repellent qualities. Although 50% Arasan is an effective repellent, it is slightly irritating to eyes, nose, and throat. Treated seed should be sown as soon as possible, as viability may be impaired by storage. Recommended rate of application is 1 lb. of 50% Arasan to 6 lbs. of seed.

Meinertzhagen, R. M. BIRDS IN GREENLAND. Bul. Brit. Ornith. Club 76(2): 17-22. Feb. 1956.
Besides notes on the avifauna, this paper describes the wasteful and widespread slaughtering of birds by Greenlanders. Existence of some species is actually endangered by intensive egging and destruction of breeding adults. There are few protective laws and little attention is paid to them. Author suggests placing high tax on arms and ammunition, prohibiting egging after June 15, prohibiting killing of adults on breeding grounds, giving certain colonies absolute protection, appointing official protector and law enforcer, and educating the young against cruelty.

Murie, Olaus J. (Moose, Wyo.) BLOOD MONEY FOR SCHOOL CHILDREN. Aud. Mag. 58(3): 116-117, 126, 3 sketches. May-June 1956.
Protests hiring of children to destroy magpies and their nests as being poor ethics and poor education for conservation and sportsmanship.

Salomonsen, F. DEN DANSK VILDTSTATISTIK [DANISH GAME STATISTICS]. Dansk Ornith. Foren. Tidsskrift 48: 123-126. 1954. [Abstract by D.A.Z., Auk 73(2).]
"It appears that a total of about 2 million birds are shot by hunters annually in Denmark." Figures are given for various waterfowl, shore-birds, birds of prey, gulls, and certain other birds.

Snow, D. W. (Ed. Gray Inst., Oxford U., Eng.) THE ANNUAL MORTALITY OF THE BLUE TIT IN DIFFERENT PARTS OF ITS RANGE. Brit. Birds 49(5): 174-177. May 1956.
Summary: "1. The annual mortality of the Blue Tit is estimated by the proportion of first-year to adult birds in museum specimens collected in the breeding season. 2. In the British population the annual mortality of adults appears to be about 70%. 3. The figures indicate that the mortality of juveniles

is higher than that of adults in October and November, but from December onwards juvenile and adult mortality are about equal. 4. Annual mortality of adults in different parts of the range is correlated with clutch-size." "Thus Blue Tits can either breed slowly and live longer, or breed faster and die sooner. It is suggested that the control lies, ultimately, not in the mortality factors themselves, but in the number of young which they can produce annually in the area in which they live."

Terres, John K. (Natl. Aud. Soc.) DEATH IN THE NIGHT. Aud. Mag. 58(1): 18-20, 3 photos. Jan.-Feb. 1956.
Reviews mass deaths of small birds at ceilometers and reports on progress in controlling them. Tests show that ceilometers function well and attract no birds when covered with filters that permit only ultraviolet rays to pass. The filters cost $400 but military fields already have them for defense purposes. The U. S. Weather Bureau has tested them successfully at commercial fields and it is hoped that their use will spread. Meanwhile, turning off ceilometers as much as possible during critical periods for birds is helping with the problem in areas where enough interest exists.

BIRDS--PARASITES AND DISEASES

Bullock, Dillman S. (El Vergel, Angol, Chile.) VULTURES AS DISSEMINATORS OF ANTHRAX. Auk 73(2): 283-284. Apr. 1956.
Evidence that vultures and dogs can spread anthrax through their feces after feeding on carcasses of diseased animals.

Mawson, Patricia M. (U. of Adelaide, S. Australia.) THREE NEW SPECIES OF SPIRURID NEMATODES FROM CANADIAN BIRDS. Can. J. Zool. 34(3): 193-199, 15 figs. June 1956.
Abstract: "Microtetrameres canadensis from the snowy owl and the great blue heron, Synhimantus (Desportesius) canadensis from the bittern and great blue heron, and Echinuria borealis from ducks are described as new species."

Worth, C. Brooke. (U. Pa. Sch. Med.) A POX VIRUS OF THE SLATE-COLORED JUNCO. Auk 73(2): 230-234 + 2 pls. Apr. 1956.
A virus was isolated from a nodule of "foot-disease." Several species of birds were infected successfully. Effects and relationships of the virus are considered.

GAME BIRDS--GENERAL

Hammer, Marie, M. Køie and R. Spärck. UNDERSØGELSER OVER ERNAERINGEN HOS AGERHØNS, FASANER OG URFUGLE I DANMARK (Studies on the food of partridges, pheasants and blackgrouse in Denmark). Dansk Vildtundersøgelser, Hefte 4. 1-24 p., 5 figs. 1955.
Adult partridges (Perdix perdix) are primarily seed eaters. Pheasant (Phasianus colchicus) are more general in food habits. The young of both eat large quantities of insects. Black grouse (Lyrurus tetrix) feed primarily on berries.--V. F. Flyger.

Masson, Vic. (Ore. Game Comm.) GAME FARM PROGRAM. Ore. State Game Comm. Bul. 11(7): 3-6, 6 figs. July 1956.
Figures and graphs for the years 1945-55 are discussed to show that releases of game-farm pheasants in Ore. had little effect on statewide populations or kills. With such evidence in hand, the Ore. Commission decided in 1951 to reduce artificial propagation of pheasants by 40% and to put the saving into habitat improvement and propagation of new game birds. Game farms are now producing chukars, Hungarian partridges, and bobwhites as well as pheasants. Stocking today is done chiefly to establish birds where they are lacking or to boost hunting where birds are scarce. Each release site must have adequate habitat.

Gallizioli, Steve. (Ariz. Game Dept.) THAT CONTROVERSIAL 1955 QUAIL SEASON. Ariz. Game & Fish Dept. Wildl. News 3(2): 8-9, 2 figs. Spring 1956.

Was Arizona's poor population of Gambel quail in 1955 caused by overshooting in 1954? Not according to research on study areas. Present seasons cause a kill of no more than 24%. Natural losses between Sept. and hunting season av. almost twice as great. About half the kill occurs on the first week end and less than 15% on the third week end. With quail density about the same, twice as many hunters in 1953 as in 1954 removed only 3% more quail than in 1954. Quail are lower on a closed area than on the hunted area. Decreases were the same on hunted and unhunted areas. The real reason for population drops is lack of green feed following an unusually dry winter. Hatch is lower and loss of adults is greater under these conditions. Winter of 1955-56 was also dry and--barring unexpected spring rains--it is likely that quail will be even scarcer in 1956 than in 1955.

Gehrken, George A. (Va. Comm. Game, Franklin, Va.) SHRUB LESPEDEZA AS A QUAIL MANAGEMENT PLANT IN SOUTHEASTERN VIRGINIA. J. Wildl. Mgt. 20(3): 239-242, 1 graph. July 1956.

Bobwhite population trends were followed for yrs. 1948-53 on 14 farms on which were good stands of shrub lespedeza. Hunters supplied data from which quail population trends of the region could be followed. Yearly variation in age ratios of quail in the region was ascertained from wings collected by hunters. "Since it is apparent that quail populations on the farms planted with bicolor lespedeza showed the same trends over the study period as they did elsewhere in southeastern Virginia it must be concluded that the plantings had no practical benefits in increasing quail populations." Numbers of coveys on farms that had lespedeza plantings were about the same at the end of the study as they were before the plantings were made.

Gullion, Gordon W. (Nev. Game Comm., Elko.) EVIDENCE OF DOUBLE-BROODING IN GAMBEL QUAIL. Condor 58(3): 232-234. May-June 1956.

Kozicky, E. L., R. J. Jessen, and G. O. Hendrickson. (Iowa State Coll.) ESTIMATION OF FALL QUAIL POPULATIONS IN IOWA. J. Wildl. Mgt. 20(2): 97-104, 1 fig. Apr. 1956.

The possibility of using random samples of forties (land units of about 40 acres) and prior classification of these forties into likelihood classes of containing bobwhites is discussed as a means of estimating annual fall quail populations. The investigation of 3 sampling schemes on a limited area over a 5-year period revealed that incomplete matching of forties with stratified optimum allocation will probably provide the most efficient scheme for estimating either the year-to-year changes or the percentage of forties occupied by quail. Iowa fall quail census data, based on judgment sampling, are summarized from 1939 through 1953 for 32 counties.--E. L. Kozicky.

Laessle, Albert M., and O. Earle Frye, Jr. (U. Fla.) A FOOD STUDY OF THE FLORIDA BOBWHITE. J. Wildl. Mgt. 20(2): 125-131, 4 figs. Apr. 1956.

Analysis by air-dry weight was made of contents of 375 quail crops taken throughout each month over a 3-year period from a 62,000-acre study area in flatwoods of Charlotte Co., s. Fla. Food habits differed from those of other se. areas principally in infrequency of legumes, importance of sedges, and greater quantity of animal matter. A toad (Bufo quercicus) was one of the major animal foods. Slough-grass (Scleria muhlenbergii) was the most important single item, forming 26.6% of the total. Comparisons of nutritional analysis and consumption of this item and the quantitatively second ranking food, wax-myrtle (Myrica spp.), indicate that quail select foods most nearly satisfying their nutritional needs. Many food items not previously recorded for quail were found. Seasonal variations in food habits showed a definite pattern during the 3 years, with occasional conspicuous departures from the normal.--O. E. Frye, Jr.

Meise, Wilhelm. CONCERNING PROPAGATION, SEXUAL MATURITY, AND INTERIM AND FURTHER MIGRATION IN THE QUAIL. Die Vogelwarte 17(3): 211-215. 1954. [From abstract by Frances Hamerstrom, Bird-Banding 27(3).

In German. On C. coturnix. "The first part of this paper summarizes some Japanese work on the Quail... Topnotch hens lay up to 30 eggs per month--365 per year--and are used for egg production for 1 to 1-1/2 years. The Quail are raised in batteries, with artificial light, on a ration of meal: 50% rice; 40%

wheat or clover powder; 10% rye; supplemented by 30%-50% fishmeal and 15%-20% [sic] ground mollusk shells. The incubation period is 16 days and hens start laying when they are 40-50 days old! Meise adds that Quail can start 'interim migration' when they are only slightly over six weeks old. Interim migration is defined as migration in the interim between completion of the brood and before the real migratory departure. This differs from movements away from unfavorable habitats which also occur. He suggests that the remarkable precocities of the Quail may have survival value in the wild, especially for birds such as these whose semi-arid range has marked fluctuations in carrying capacity."

Mraz, F. R., R. V. Boucher, and E. W. Callenbach. (Pa. Agr. Exp. Sta., U. Park.) THE RESPONSE OF BOBWHITE QUAIL TO ANTIBIOTICS. Poultry Sci. 35(1): 76-80. Jan. 1956.

Effects of 5 antibiotics on growth of chicks. No long-term effects were noted, but some of the antibiotics speeded growth at ages up to 3 to 5 weeks.

Rosene, Walter, Jr. (US F&WS, Gadsden, Ala.) AN APPRAISAL OF BICOLOR LESPEDEZA IN QUAIL MANAGEMENT. J. Wildl. Mgt. 20(2): 104-110. Apr. 1956.

From 1947-54 the value of bicolor was studied on 9 hunting preserves in Ala. and S. C. Areas studied totaled 18,777 acres. Half was planted with strips of bicolor; the other half was used as a control. Results are based on distribution of 1,924 coveys and analysis of food from 822 crops. Bicolor seed is a preferred food and may be of some value where scarcity of food is a limiting factor. Where native foods were plentiful, bicolor failed to increase quail populations. Use of seed depended in part on quality of a planting. In winter, bicolor tends to attract and concentrate birds produced elsewhere. Factors such as burning, availability of nesting cover, land-use practices, and disturbances had a greater effect on populations than presence or absence of bicolor.--Walter Rosene, Jr.

Rosene, Walter, Jr., and Frank W. Fitch. (US F&WS, Gadsden, Ala.) A COMPARATIVE TEST OF THE INVESTIGATOR AS A VARIABLE IN AGING QUAIL. J. Wildl. Mgt. 20(2): 205-207. Apr. 1956.

To test the variation between individuals in aging quail using wing-feather-molt characteristics, a random sample of 200 wings collected in Ala. during the 1952-53 hunting season was sent to 5 biologists. Disagreements were classed as (1) obvious errors, (2) questionable wings, or (3) problem wings. In classification as adult or juvenile, there was disagreement on 8% of the sample, and in age of juvenile quail, 31%. More care should be taken in examinations. Some discrepancies could be traced to lack of refined techniques. This study emphasized the importance of working with large samples of birds of known age in order to know more about molt variations.--Walter Rosene, Jr.

Sowls, Lyle K., and Lynn A. Greenwalt. (U. Ariz.) LARGE TRAPS FOR CATCHING QUAIL. J. Wildl. Mgt. 20(2): 215-216. Apr. 1956.

A description of quail traps of various sizes and a discussion of the advantages of the larger traps.--Authors.

Wallmo, O. C. (Texas A & M Coll.) DETERMINATION OF SEX AND AGE OF SCALED QUAIL. J. Wildl. Mgt. 20(2): 154-156, 1 photo. Apr. 1956.

Sexual dimorphism in scaled quail is very slight, but distinctive differences were found in plumage of head and neck. An age scale for young birds was developed from the sequence of primary molt.--O. C. Wallmo.

Wehr, Everett E., and Carlton M. Herman. (Agr. Res. Center, Beltsville, Md.) LOPHORTOFILARIA CALIFORNIENSIS N. G., N. SP. (FILARIOIDEA, DIPETALONEMATIDAE) FROM CALIFORNIA QUAIL, LOPHORTYX CALIFORNICUS, WITH NOTES ON ITS MICROFILARIA. J. Parasit. 42(1): 42-44, 1 pl. Feb. 1956.

PHEASANTS

Bizeau, Elwood. (Idaho Game Dept.) RESULTS OF A FIVE-YEAR PHEASANT BANDING STUDY IN JEFFERSON COUNTY. Idaho Wildl. Rev. 8(6): 8-11, 4 photos. May-June 1956.

The Mud Lake area, Idaho, was selected for evaluation of stocking pen-reared birds because it had good habitat, heavy population of wild pheasants, and because a large proportion of bagged birds could be checked. Game farm cocks

were released at various points and on various dates. Returns from released birds were 10-19% for releases in late July, 22-30% for releases in late August, and 26-48% for releases in late Sept. Av. for all summer (July 17-Sept. 21) releases was 24%. Releases just before hunting seasen gave returns of 60-69%. Older birds gave better returns than younger ones. It is evident that returns are poor for summer releases but are better the closer releases are made to hunting season. Game farms, however, cannot keep many birds until hunting season; grown birds require too much space. Of 2,000 game-farm cocks stocked at Mud Lake, only 1.6% were recovered after year of release. The pen-reared birds constituted only 7.8% of the pheasant bag during the 5 years. Except for the unusual, experimental releases in Oct., there would have been only 1 stocked bird to every 15 wild birds in the bag. At $2.00 per bird, every stocked bird bagged cost $6.38.

Campbell, Howard. (N. M. Dept. Game.) PHEASANTS IN NEW MEXICO. N. M. Wildl. 1(4): 5. Apr. 1956.

Ringnecks do not flourish in N. M. but they are established in all suitable areas. There are about 20,000 wild pheasants in the state in early fall. In addition, some 5,000 birds a year are stocked for the gun. For those stocked in 1955, band returns were 12.5%. For those stocked in 1954, band returns from 1955 hunt were only 1.6% of the 1955 total return. Allowing for non-reporting, these figures might be doubled, but they still indicate that stocked birds should be harvested as soon as possible. Proportions of wild and stocked birds in bag varies greatly with numbers of wild birds present; this suggests that the same policies are not suitable all over state--stocking may serve a much better purpose some places than others. The fewest returns come from good habitat, the highest returns from poor habitat. This is because most hunting pressure falls on wild birds in good habitat, but elsewhere is focused on stocked birds. It would be desirable to harvest the stocked hens as well as the cocks. In 1955 the dept. did allow 1 hen in the season limit of 2 birds. About 40% of band returns were from hens. The trouble was that wild hens made up 39-61% of the total bag, and it is doubtful that the N. M. pheasant can stand this loss of breeders. The total 1955 pheasant harvest in N. M. was about 3,000 to 4,000. Thus only about 20% of the population was bagged. Allowing for cripples, kill may have been 30%. It seems certain that cocks, at least, should have been harvested more heavily.

Geis, Aelred D., and Lucien H. Elbert. (Patuxent Refuge, Laurel, Md.) RELATION OF THE TAIL LENGTH OF RING-NECKED PHEASANTS TO HAREM SIZE. Auk 73(2): 289. Apr. 1956.

Under conditions of high population density and a sex ratio of nearly 1:1, cocks that had been marked by cutting off tail were seen with 1 or more hens significantly less often than cocks with intact tails. Problems of courtship display may be involved.

Grondahl, C. B. (N. Dak. Game Dept.) PREDATORS AND PHEASANT NESTS. N. Dak. Outdoors 19(2): 14-15, 6 photos. Aug. 1956.

80 dummy nests with pheasant eggs were set out in se. N. Dak., Apr. 26-Aug. 10. Two steel traps were placed beside each nest. "Ten (approximately 15 per cent) of the 68 nests were considered successful (were not destroyed within 35 days) and the remaining 58 were destroyed--55 by predators and three by cattle or farming operations. Predators were identified at 48 of the 55 nest sites by being trapped. These predators included 20 skunks, 10 crows, 6 badgers, 2 fox, 2 raccoons, 3 house cats, 1 spotted skunk and 4 13-lined ground squirrels." Author emphasizes that significance of predation on nests is not fully understood, but that renesting lessens the importance of predation.

Guilford, H. G., and C. A. Herrick. (Herrick: U. Wis.) THE EFFECT OF GAPEWORM DISEASE IN PHEASANTS. Trans. Wis. Acad. Sci. Arts & Lett. 43: 25-50. 1954. [From abstract by J. T. E., Auk 73(3).]

"Gapeworms experimentally introduced as eggs into young pheasants developed and multiplied from the 15th to the 27th day, then declined to the 48th day. A resistance to a second infection developed after the 37th day."

Harper, Hugh. (Idaho Game Dept.) RESULTS OF PHEASANT BANDING STUDIES IN NORTHERN IDAHO. Idaho Wildl. Rev. 9(1): 3-5, 2 photos. July-Aug. 1956.

Nearly 5,000 game-farm cocks were banded and released in 3 areas, 1952-55. Band returns were obtained by checking stations and publicity. Allowance was made for bands not returned. Results are detailed in tables and text. Returns increased, of course, when release dates approached hunting season. But on the average, estimated total recovery was 12.6, 23.4, and 33.9% for the 3 areas. Cost of birds was $2.00 each. If one release just before hunting season is excluded, cost per bird bagged varied from $6.35 to $15.80. Conclusions: "1. Game farm cocks which are not harvested during the first hunting season after liberation contribute very little to succeeding hunting seasons. 2. In areas of low pheasant production (Boundary County) game farm cocks form an important part of the hunter's bag. In areas of good pheasant production (Nez Perce County) game farm cocks play a minor role in the hunter's bag. 3. Even under release conditions where fairly high returns are realized on game farm cocks, each bird harvested represents a sizable amount of license money."

Kabat, Cyril, R. K. Meyer, K. G. Flakas, and Ruth L. Hine. (Wis. Cons. Dept.) SEASONAL VARIATION IN STRESS RESISTANCE AND SURVIVAL IN THE HEN PHEASANT. Wis. Cons. Dept., Tech. Wildl. Bul. no. 13. 1-48 p., 4 figs. 1956.

Groups of hen pheasants were subjected to stress in the form of caging and starvation at various times of year. Effects were judged by weight loss, temperature decline, and survival time. Birds were light in weight and severely affected by stress after time of laying, when post nuptial molt was under way. After this period, fat reserves were built up and resistance to stress increased throughout fall and winter. Peak of fitness was reached just before nesting season. Early in egg laying, when hens had lost little weight, stress effects were again severe; energy reserves apparently were low. Hens that were late in starting postnuptial molt proved to be low in stress resistance. Early molters had gained more weight by Sept., but they lost more weight during stress. Adult hens withstood stress better than immatures did although both groups lost similar proportions of weight. Birds hatched early in spring appeared more resistant than those hatched later. Wild birds that were slightly diseased and/or undernourished withstood stress less well than game-farm birds. Caging alone caused some stress and weight loss comparable to that of molting. Artificial feeding of wild birds during hard winters is recommended to increase stress resistance, minimize food searching, and to have birds in good condition for nesting. Pen-reared birds should be released in good weight. The same applies to introduced or transplanted birds. Also, birds should be released as long before nesting as practicable. Stress of laying may account for summer hen mortality. Stress effect of bad weather may contribute to population fluctuations. Seasonal and other stress effects may explain differential reactions of animals to various experiments.

Lyon, L. Jack. EFFECTS OF CERTAIN WEATHER CONDITIONS AND AGRICULTURAL LAND-USE CHANGES ON PHEASANT NESTING AND PRODUCTION. M. S. thesis, Colo. A & M Coll. 163 p., illus. Mar. 1953.--L. E. Yeager.

Semones, Vernon D., and Charles G. Crispens, Jr. (Ohio State U.) THREE RECORDS OF MALE MONGOLIAN PHEASANTS INCUBATING CLUTCHES. J. Wildl. Mgt. 20(2): 200-201. Apr. 1956.

Observations of 3 male Phasianus colchicus mongolicus incubating clutches were made in experimental pens. Females were present in the pens.--Authors.

Sunde, M. L., and H. R. Bird. (U. Wis.) A CRITICAL NEED OF PHOSPHORUS FOR THE YOUNG PHEASANT. Poultry Sci. 35(2): 424-430, 10 figs. Mar. 1956.

From summary: "Pheasant chicks have been fed a diet containing .66 percent phosphorus (chemical analyses). When this diet was fed, high mortality resulted. The pheasant chicks, after two weeks on this diet, showed a distinct bending of the tarsometatarsus near the hock joint and of the proximal end of the tibiotarsus. Bone ash values were reduced from a normal of about 52 percent to 38 percent when the basal diet was fed. Additions of .3 percent to .8 percent of phosphorus from dicalcium phosphate resulted in normal growth, normal bone formation and calcification."

Williamson, Leslie A. (Conn. State Bd. Game.) COOPERATIVE SIX-WEEK PHEASANT PROGRAM, TEN YEAR SUMMARY - 1945-55. Conn. State Bd. of Fish. & Game. 18 p., mimeo. 1956.

Quantitative account, with many tables, of the program under which Conn. buys and distributes to hunting clubs pheasant chicks 6 weeks old. Present cost to state is about 87¢ per bird. Rearing success has been 84%. Today almost all (97%) of the birds are released just before or during hunting season. Both sexes are legal game.

GROUSE, PARTRIDGE, ETC.

Anon. THE CAPERCAILZIE. Nature 178(4524): 79. July 14, 1956.

"An account of the feeding habits and breeding behavior of the capercailzie has been set out in No. 37 of the Forestry Commission's admirable leaflets." The species was exterminated in Great Britain by about 1771. It was re-established, but only in Scotland, by introductions from Sweden in 1837. The bird is now common enough to present a small problem in forestry. Typical habitat is hillsides with woods of mature Scots pine. Conifer plantations are invaded when they reach a height of about 25 ft. "In winter, the capercailzie's food includes the shoots, buds, leaves, seeds and young cones of the Scots pine, and occasionally those of other conifers. These, however, form only a small proportion of its total food supply, and where only relatively small numbers of capercailzies are found amid middle-aged or maturing pinewoods, little serious economic damage results. The position may be very different in young, newly established plantations, particularly where these lie close to older woods with a heavy stocking of capercailzies. These birds find the winter buds and growing shoots of the young pines very palatable, and all too often they peck out the leading bud, thus causing serious loss of annual growth and perhaps a distorted stem." Control is necessary only under certain circumstances and is easily enough accomplished by shooting. The bird may be encouraged except when it becomes too numerous in young plantations.

Anon. LESSER PRAIRIE CHICKEN STUDY CONTINUES; POPULATION AT VERY LOW EBB. Okla. Game & Fish News 12(8): 16. Aug. 1956.

The lesser prairie chicken is probably at an all-time low in nw. Okla. and is considered in grave danger of extinction. There is now about 1 bird where there were 4 in 1938, and 1938 was the year of a cyclic low when the population was only 44% that of 1933. The current and unprecedented drought in w. Okla. is thought to be largely responsible through reduction in cover and food.

Anon. NEW PARTRIDGES NONCOMPETITIVE. Texas Game & Fish 14(7): 23. July 1956.

Red-legged partridges stocked in West Texas have competed very little with scaled quail. "The redleg is a grazer, being very fond of greens. Approximately 90 per cent of his food is green vegetation; whereas, the great majority of the food of the scaled quail is seeds. There is a slight overlap on food requirements, depending on the season, but not to a point of severe competition. And even though their territories coincide, the fondness for greens has led the redleg to be associated with winter grain fields. This is not true of the scaled quail whose associations with these fields are less pronounced and cover their territory in true 'gypsy' fashion."

Enyeart, George. RESPONSES OF SAGE GROUSE TO GRASS RESEEDING IN THE PINES AREAS, GARFIELD COUNTY, UTAH. M. S. thesis, Utah State Agr. Coll. 55 p. 1956. [From Quart. Rep. Utah Coop. Wildl. Res. Unit 21(2).]

Hamerstrom, Frederick, and Frances Hamerstrom. (Wis. Cons. Dept., Plainfield.) POPULATION DENSITY AND BEHAVIOR IN WISCONSIN PRAIRIE CHICKENS. Acta XI Congr. Internat. Ornith. 1954. p. 459-466, 2 figs., 2 pls. 1955.

The authors present booming-ground data for 16 springs, during 12 of which intensive studies were made. Year to year changes in numbers of males were rather erratic but in general suggested existence of a 10-year cycle. Counts of males varied from about 257 on the area in 1940 to about 76 in 1947. Population declines were greatest in poor habitats. Booming grounds tend to persist

year after year, but their sizes and the numbers of birds using them vary widely. The number of females that come to a booming ground varies directly with the number of males present. But the number of copulations is greatest at booming grounds of medium size (11-15 males) and drops off at larger or smaller grounds. Perhaps copulations are concentrated in time at grounds of medium size and more spread out at large grounds. The known spread of hatching dates suggests that this is true.

Honess, Ralph F. (Wyo. Game Comm.) A NEW FLAGELLATE, TRITRICHOMONAS SIMONI FROM THE SAGE GROUSE, CENTROCERCUS UROPHASIANUS. Wyo. Game & Fish Comm. Bul. 8, art. 1: 1-3, 2 figs. June 1955.
Includes key to the 4 known tritrichomonads of birds.

Honess, Ralph F., and George Post. (Wyo. Game Comm.) EIMERIA OF GROUSE (FAMILY: TETRAONIDAE), WITH A DESCRIPTION OF EIMERIA PATTERSONI N. SP. FROM THE SAGE GROUSE. Wyo. Game & Fish Comm. Bul. 8, art. 2: 5-11, 2 figs. June 1955.

Matheson, Colin. (Natl. Mus. Wales.) FLUCTUATIONS IN PARTRIDGE POPULATIONS. Brit. Birds 49(3): 112-114. Mar. 1956.
Presents 2 sets of game-bag records for Perdix perdix in Britain. One, for an estate in Norfolk, is for the years 1847-73. The other, for an estate in Cardiganshire, is for the years 1832-69. Neither set has been readily available before for study of fluctuations. These and other data now at hand support the idea of a definite correlation between the peak periods on different estates.

Sparks, Earl A. CHUKAR PARTRIDGE PRODUCTION UNDER GAME FARM CONDITIONS. Utah State Dept. Fish & Game, Dept. Inf. Bul., Fed. Aid Div., no. 21. vii + 45 p., 8 figs. July 1955. [Also M. S. thesis, Utah State Agr. Coll. 45 p. 1956.]
"The study included chukar egg production and fertility as affected by vitamin supplements; hatchability as affected by relative humidity, vitamin supplements, and storage; protein levels and vitamin supplements in chukar starting rations; and effects of different maintenance rations to brood-stock chukars."

Westerskov, Kaj. (Wildl. Div., Wellington, N. Z.) HISTORY AND DISTRIBUTION OF THE HUNGARIAN PARTRIDGE IN OHIO, 1909-1948. Ohio J. Sci. 56(2): 65-70, 2 maps. Mar. 1956.
Summary: "1. Introduction of the Hungarian partridge into Ohio was justified as no native game bird was found in any numbers in the new habitat created when forest lands were converted to croplands. 2. Between 1909 and 1940 a total of 17,420 partridges were imported from Europe (Czechoslovakia) and were released in all parts of the state. The total cost of the birds was $62,100. 3. Partridges increased in numbers in western and northwestern Ohio up till about 1937-40 when a rapid decline began. At its peak in the thirties the fall population numbered about 100,000 birds. 4. The decline in the Ohio partridge population seems to be general and not a cyclic low."

Westerskov, Kaj. (Wildl. Div., Wellington, N. Z.) AGE DETERMINATION AND DATING NESTING EVENTS IN THE WILLOW PTARMIGAN. J. Wildl. Mgt. 20(3): 274-279, 1 fig. July 1956. [Reprints available from Wildl. Mgt. Inst., Wire Bldg., Wash. 5, D. C.]
Author's summary: "The regular wing moult in the willow ptarmigan [Lagopus lagopus] has been utilized in devising a reference chart from which can be obtained the approximate ages of the birds examined as well as the dates for onset of the egg-laying, incubation and hatching. Methods for distinguishing adult from juvenile ptarmigan, and data for determining the age in ptarmigan chicks are also presented. The material utilized was collected by Norwegian biologists. The basic facts employed--in addition to the primary moult data--were: commencement of the egg-laying period varying between 18 May and 13 July; average number of eggs per nest 10; egg-laying rate 1.1 egg per day; duration of the incubation period 21 days."

Wichmann, R. W., and R. A. Bankowski. (Sch. Vet. Med., U. Calif., Davis.) A REPORT OF TRICHOMONAS GALLINARUM INFECTION IN CHUKAR PARTRIDGES (ALECTORIS GRAECA). Cornell Vet. 46(3): 367-369. July 1956.
This lethal disease found in game farm chukars for first time.

TURKEY

Bailey, R. Wayne. (Cons. Comm. W. Va.) SEX DETERMINATION OF ADULT WILD TURKEYS BY MEANS OF DROPPING CONFIGURATION. J. Wildl. Mgt. 20(2): 220, 1 photo. Apr. 1956.

Droppings of gobblers are straighter, longer, and greater in diameter than those of hens. Droppings of adult gobblers may be 15 mm. in diameter, while those of immature gobblers in the fall seldom exceed 10 mm. Droppings of hens are from 5-8 mm. in diameter and are characterized by their looped, spiral, or bulbous shape.--C. O. Handley, Sr.

Latham, Roger M. (Pa. Game Comm.) COMPLETE BOOK OF THE WILD TURKEY. Stackpole Co., Harrisburg, Pa. xx + 265 p., illus. 1956. $4.95.

Although written primarily for hunters, this book contains much information of interest to wildlife biologists. It is popular in that it is written in informal, narrative style, is only lightly documented, contains numerous anecdotes and examples, and is devoted in part (p. 153-265) to suggestions for arms and ammunition, field equipment, a variety of turkey callers, methods of hunting, field dressing, and cooking. The rest of the volume covers biology and management in nontechnical terms and gives a lot of good, up-to-date, original and compiled information. These sections are comprehensive enough to justify purchase of the book for a wildlife library. Like the other sections, they reflect first-hand experience. Sex and age characters, habits, reproduction, habitat requirements, limiting factors, predation, diseases, accidents, competition, hunting restrictions, refuges, stocking, forest management, and winter feeding are discussed in significant detail. The section on habitat requirements stresses the need of mature or nearly mature forests. The long section on predation shows that this factor is generally unimportant in checking populations and has biological values. Competition with seed-storing mice is important, and so is the illegal shooting that virtually eliminates turkeys in some areas. Refuges are useful if adjusted in size and quality to local conditions. Stocking is worse than useless unless done with healthy, wild-type birds in areas where turkeys are lacking. Cover management should emphasize preservation of mature hardwoods and creation of scattered openings where greens, fruits, and insects will abound. Food patches are not recommended, but suggestions for using them are given. Winter feeding of ear corn is strongly recommended for areas that have deep snow. It is interesting to read that effectiveness of the feeders depends on squirrels shelling corn onto the ground or snow.

Schemnitz, Sanford D. (Okla. A & M Coll.) WILD TURKEY FOOD HABITS IN FLORIDA. J. Wildl. Mgt. 20(2): 132-137, 2 maps. Apr. 1956.

Food habits study of wild turkey based on 32 crops from 10 areas and 2775 droppings from 16 areas in peninsular Fla. Acorns, pine seed, black gum (Nyssa sylvatica) seed, cabbage palm (Sabal palmetto) seed, wax myrtle (Myrica sp.) seed, and grass seeds and leaves were the major foods. Insects composed 2.9 and 3.6% respectively of food found in crops and droppings. Self feeders filled with corn (Zea mays) appeared to be utilized by wild turkeys mainly in late winter and early spring. 210 quarter-acre plots were examined in 8 major vegetation types occupied by turkeys to determine availability of food plants.--S. D. Schemnitz.

DOVES AND PIGEONS

Jenkins, James H. A CONTRIBUTION TO THE PHYSIOLOGICAL ECOLOGY OF THE MOURNING DOVE, ZENAIDURA MACROURA CAROLINENSIS (LINNAEUS): A STUDY OF AGE AND SEASONAL CHANGES IN FEATHERS, GONADS, WEIGHT, AND LIPID DEPOSITION. Ph. D. thesis, U. Ga. 1955.

Based on study of wild and captive doves near Athens, Ga. The single annual molt begins in summer and ends in fall. The regular pattern of molt can be used to ascertain age of young. The bursa is reliable indicator of young-of-year until it disappears at age of about 7 months. Most males are in breeding condition Feb. to Sept.; females, April or May to Sept. Ovaries cannot be used to determine reproductive history for period of more than 30 days. There is little Sept. nesting at Athens, yet 1/3 of adults bagged then have active crop glands, suggesting that nesters are more vulnerable to hunting. Adults are

heaviest in winter; weights decline through Sept. Juveniles grow heavier Aug. through Dec. Changes in abdominal lipid deposition parallel changes in weight, but there is also a premigrational deposition, especially in fall. Most young bagged in Sept. are hatched May-June. 80% of doves shot in Sept. are young. Juvenile-adult ratio cannot be used to estimate success of reproduction. Migratory status was judged from gonad and lipid interrelationships. About 40% of doves shot in Sept. are from north and 60% are of local origin. Banding data indicate that these migrants come from the Carolinas. Doves from Midwest and North arrive later. [From summary; text not seen.]

WATERFOWL

Allan, Philip F. (US Soil Cons. Serv., Ithaca, N. Y.) A SYSTEM FOR EVALUATING COASTAL MARSHES AS DUCK WINTER RANGE. J. Wildl. Mgt. 20(3): 247-252. July 1956.

A livestock range-condition classification for coastal marsh ranges, based upon plant succession dynamics and the response of dominant, subdominant, and invading plants to varying intensities of livestock usage, can be adapted (with appropriate modifications) as a guide in evaluating the quality of winter habitat for ducks. Range condition for livestock is determined by appraising the quantitative composition of dominant forage species plus the normal complement of subdominants under undisturbed conditions. Thus 75-100%, excellent condition; 50-75%, good; 25-50%, fair; 0-25%, poor. Duck habitat qualities are almost completely inverse to livestock range condition in Gulf Coast marshes; i.e., "Excellent" habitat condition occurs when 75-100% of plant composition is "invading" annuals and other plants. Habitat evaluations aid land-planning organizations in: (a) Pointing out to land-owners values of marshes to wintering ducks. (b) Determining kinds and extent of plant composition changes required for duck habitat improvement. (c) Determining extent of damage or destruction of duck habitats by drainage or other works.--P. F. Allan.

Anon. BOMBING MARSHES WITH RICE. Iowa Cons. 15(6): 44, 1 photo. June 1956.

"A new wrinkle in Iowa waterfowl management will be tried this spring by the State Conservation Commission. Limited amounts of a new variety of domestic rice have been planted on two Iowa marsh areas by Commission game workers as an experiment in attracting and holding waterfowl. The rice is of a new variety which matures in 90 days, growing up through as much as 8 inches of murky water and producing heavy yields. It is said to grow well when seeded directly on wet ground... The rice was sown from airplane, and according to game officials this spring may be an ideal time for such planting since most marsh areas are low and have broad mud flats exposed. Rice--domestic or wild--is highly attractive to waterfowl because of its great food value and the fact that it is easily accessible to ducks and geese in wet areas." Copied almost completely.

Atkinson-Willes, George. WINTER COUNTS OF MALLARD IN BRITAIN, 1951-1954. 7th Ann. Rep. Wildfowl Trust: 39-45, 7 graphs. 1955.

Data on nation-wide and local fluctuations in numbers are discussed for 3 winters and an attempt is made to correlate numbers with weather conditions.

Atlantic Waterfowl Council. WATERFOWL IDENTIFICATION GUIDE. Atlantic Waterfowl Council. 1-55 p., illus. 1956. [Available from US F&WS and game depts. of Atlantic coastal states and Vt. and W. Va.]

Copies of this booklet may be seen with the name of the US F&WS or one of 17 state game departments printed above the title on the cover and seeming to be part of the title. The copies are identical except for this identification of the distributing agency. The pamphlet is designed for hunters and consists mainly of Peterson-type drawings of all important waterfowl species of the East. Also included are cormorant, loon, grebes, gallinules, coot, rails, snipe, and woodcock. A typical page shows a male and a female of a species in flight and larger views of heads. Diagnostic points are indicated. All drawings are scratchboard illustrations by Alan R. Munro. The 6 introductory pages of text briefly review reasons for regulations, discuss use of the booklet, tell how waterfowl populations are studied, and stress the importance of proper shooting practices.

Barry, Thomas W. (Cornell U.) OBSERVATIONS OF A NESTING COLONY OF AMERICAN BRANT. Auk 73(2): 193-202, 1 map. Apr. 1956.

The author observed Branta bernicla hrota in the Boas River area of Southampton Is., Hudson Bay, in summer of 1953. He gives notes on arrival date, nest, nest defense, territorial behavior, predation on eggs by gulls and jaegers, egg laying, clutch sizes, incubation period, nesting success, actions of adults near nest, foods, activities of nonbreeding yearlings, development of captive young. There were about 700 nesting pairs and 400 yearlings in the area, which indicates a tremendous increase in the last 20 years. The paper includes a "Phenology Chart" that lists arrival dates of various avian species.

Beer, J. V. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) ASPERGILLOSIS IN WILD GEESE: A NEW TECHNIQUE FOR ITS DETECTION. 7th Ann. Rep. Wildfowl Trust: 138. 1955.

Berg, Paul F. (US F&WS, Sacramento, Calif.) A STUDY OF WATERFOWL BROODS IN EASTERN MONTANA WITH SPECIAL REFERENCE TO MOVEMENTS AND THE RELATIONSHIP OF RESERVOIR FENCING TO PRODUCTION. J. Wildl. Mgt. 20(3): 253-262. July 1956.

A study was conducted on 2 waterfowl trend areas in e. Mont. during summers 1953 and 1954 to evaluate effect of fencing artificial reservoirs on vegetation and brood production. Data were also collected on brood movements, involving marked individuals, during spring and summer of 1954, on 1 of the areas. Effectiveness of marking is described. Some relationships between reservoir size, emergent and/or riparian vegetation, and rate of water loss as concerns brood movements and usage, are presented.--P. F. Berg.

Boeker, Hal M. WATERFOWL PRODUCTION IN THE YAMPA RIVER VALLEY, COLORADO. M. S. thesis, Colo. A & M Coll. 117 p., illus. Nov. 1953.--L. E. Yeager.

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) NOTES ON COLOUR MARKING OF GEESE. 4th Ann. Rep. Severn Wildfowl Trust: 14-16. 1950-51.

Various ways of staining birds for field recognition were tried. Found unsatisfactory were quick-drying cellulose paints, artists' oil colors, and waterproof inks. Considered good in initial intensity and resistance to fading were the dyes Rhodamine B, Auramine, and a combination of them. Methods of use and effects on birds are described.

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) NOTES ON FIELD COUNTS OF AGE-GROUP RATIOS AND BROOD-SIZE. 5th Ann. Rep. Severn Wildfowl Trust: 14-19. 1951-52.

On European white-fronted geese at Slimbridge, Eng. "The principal findings are: (1) in the three seasons 1947-50 the proportion of first-winter birds was 21-22 per cent., but this proportion rose to 36 per cent. in 1950-51 and 37 per cent. in 1951-52; (2) the extreme values for the mean brood-size were 2.94 in 1950-51 and 3.64 in 1951-52; (3) an attempt is made to estimate the proportions of breeding and non-breeding adults in each of the last three winters and to determine how many of the non-breeding birds were sexually mature but without young and how many were sexually immature. From the two later seasons 1949-50 apparently differed in having a much smaller proportion of parents and a much higher proportion of mature adults without young."

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) SOME RESULTS OF RECENT BRITISH MALLARD RINGING. 6th Ann. Rep. Wildfowl Trust: 90-99. 1954.

From summary: "The conclusion of Höhn (1948), from earlier ringing of mallard in Britain, that juvenile mortality is greater than adult is confirmed for the ducks ringed at Abberton but not for those ringed at Slimbridge. This disagreement is probably due to differences in the extent of local movements by juveniles and adults and particularly to much heavier shooting pressure in the immediate vicinity of Abberton. Additional evidence is provided for the undesirability of using data from hand-reared ducks in the estimation of mortality rates for wild populations. The difference in juvenile and adult mortality is shown to result principally from casualties in the early autumn. Males appear to be more vulnerable to shooting than females, but more females than males fall victims to predators and accidents. Casualties of this kind

occur mainly from March to July. The age- and sex-ratios amongst Mallard caught at Abberton and Slimbridge show great variation between the two localities, between different years at each locality and during each autumn, but insufficient data are available to enable these variations to be explained satisfactorily. At Slimbridge more males than females are caught in August and September, but fewer from October to February. At Abberton males are nearly always more plentiful than females. The sex-ratios of adults and juveniles seem to vary independently."

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) WHITE-FRONTED GOOSE STATISTICS, 1952-53. 6th Ann. Rep. Wildfowl Trust: 73-79. 1954.

Further data on European whitefronts in England. "The principal results are: (1) the mean proportion of first-winter birds in 1952-53 was 33%, a figure similar to those obtained in the two preceding winters; (2) the mean brood-size was 3.18, less than in 1951-52 but greater than that in 1950-51; (3) 6.0% of families were accompanied by only one parent; (4) only 2.2% of first-winter birds were not in family parties; (5) estimates of the survival factor from observations of ringed geese suggest that about forty of every hundred geese alive at 1 January die before the following 1 January; (6) analysis of the composition of the adult population indicates that the proportion of second- and third-winter birds is increasing, or the proportion of older birds decreasing, a condition characteristic of a growing population; (7) it is shown that many second-winter birds were paired, although no birds less than 3 years old are known to have been parents."

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) THE ROLE OF TRADITION IN DETERMINING THE WINTER DISTRIBUTION OF PINKFEET IN BRITAIN. 7th Ann. Rep. Wildfowl Trust: 107-122, 1 map. 1955.

From summary: "559 recoveries and 155 recaptures of Pinkfeet ringed in Britain since 1950 provide some information on the distribution of the species in Britain... There are evident tendencies for marked birds to remain in the areas where they were captured during the following winter, and to return to these areas in later years, particularly at the corresponding season. The proportions of geese remaining in, and returning to, an area show regional differences... Pinkfeet marked as adults show greater attachment to the region of marking than those marked in their first autumn of life. These young birds behave like older ones caught in the same places during their first winter, as would be expected from the persistence throughout the winter of family groups in geese. But in their second and later winters they are more likely to visit other areas than are their parents." Several wintering populations can be distinguished in Britain; these populations display varying amounts of sedentariness and travel.

Boyd, Hugh, and Peter Scott. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) THE BRITISH POPULATION OF THE PINK-FOOTED GOOSE, ITS NUMBERS AND ANNUAL LOSSES. 7th Ann. Rep. Wildfowl Trust: 99-106, 1 graph. 1955.

Data for several years were analyzed by various mathematical methods to estimate size of population and annual losses. It is believed that there were about 43,000 pinkfeet wintering in Britain at the beginning of Oct. 1953. Methods used are considered accurate enough to reveal marked trends. Between 1950 and 1953 the death rate of adults was about 26% and that of yearlings about 42% per year. Total mortality for 1953 was estimated at 14,000, with some 12,000 killed by shooting. It is thought that this yield can be sustained. Data are also given on populations, losses, and productivity in other years.

Bue, Ingalf Gilbert. THE ECOLOGY OF WATERFOWL POPULATIONS ON STOCK PONDS IN WESTERN SOUTH DAKOTA. Ph. D. thesis, U. Minn. 163 p. 1956. [From abstract in Dissertation Abstracts 16(6).]

Work in 1950-51 disclosed that stock ponds built since 1937 represented a new breeding area that produced about 200,000 waterfowl annually. Over 80% of breeders were blue-winged teal, mallard, and pintail. Also breeding were shoveller, gadwall, and baldpate. Diving ducks rested but did not breed on the ponds. Fifty-five percent of nests were successful, and 65% of pairs brought off broods. Overgrazing destroyed shoreline vegetation, thereby reducing duck populations and nesting. High turbidity and overpopulations of fish reduced

waterfowl usage and excluded some species of waterfowl. A food habits study was made and the relationship of food used to that available was discussed. Management measures recommended are: "(1) keeping grazing intensity within the carrying capacity of the range, (2) selective fencing on ponds that are and will continue to be overgrazed, and (3) control of fish populations."

Collias, Nicholas E., and Elsie C. Collias. (Ill. Coll., Jacksonville.) SOME MECHANISMS OF FAMILY INTEGRATION IN DUCKS. Auk 73(3): 378-400, 1 graph. July 1956.

Detailed study, made at Delta Waterfowl Research Station, of roles of sensory cues and learning in the following behavior of ducklings, and of factors that affect species recognition and consequent social behavior of ducklings of various species.

Cook, Alice Richards. (Res. Dept., Parke, Davis & Co., Detroit, Mich.) THE GAMETOCYTE DEVELOPMENT OF LEUCOCYTOZOON SIMONDI. Proc. Helminth. Soc. Wash. 21(1): 1-9, 9 figs. Jan. 1954.

Crissey, W. F., compiler. 1956 STATUS REPORT OF WATERFOWL. US F&WS, Spec. Sci. Rep.--Wildl. no. 33. i + 110 p., 4 maps. Aug. 1956.

"These data are brought together for the purpose of supplying administrators with all factual information available concerning current waterfowl population status, and is intended for use primarily as a guide for setting the 1956-57 shooting regulations." Data are based on 3 surveys: kill during last hunting season, wintering grounds, and breeding grounds. Results are discussed and summarized for each flyway. Results of population and production studies made on breeding grounds in 1956 are given in considerable detail for each region within a flyway. Increases or decreases are predicted for each region of the breeding grounds and for each flyway as a whole. Many of the statements and figures pertain to individual species. In general, the southward flights of 1956 are expected to be about equal to those of 1955.

Einarsen, Arthur S. (9 Edgewood Way, Corvallis, Ore.) FOOD CRISES AND THE INTERRELATIONSHIP OF WATERFOWL. Murrelet 36(3): 39-40. Sept.-Dec. 1955 [May 1956].

At times and places of poor food conditions, puddle ducks stayed with swans and pounced on any foods that came up as the swans fed. When eelgrass was too deeply submerged to be reached by black brant, the brant stayed with diving ducks and seized fragments of eelgrass that floated up. At other times of food shortage, brant went ashore and grazed heavily on pastures.

Elder, William H. (U. Mo.) FLUOROSCOPIC MEASURES OF SHOOTING PRESSURE ON PINK-FOOTED AND GREY LAG GEESE. 7th Ann. Rep. Wildfowl Trust: 123-126. 1955.

1476 living geese of 7 British populations were fluoroscoped. Incidence of pellets was approximately the same as for Canada geese in Mo., except that more yearling Canadas had been hit. The results indicate that geese are subjected to approximately the same hunting pressure in Britain as in the Miss. Flyway, despite the very different regulations and hunting practices in the 2 areas. Percentages of geese found to be carrying pellets were: adult ♂ pinkfeet, 44.0; adult ♂ grey lag, 36.6; adult ♂ Canadas, 44.5; adult ♀ pinkfeet, 38.5; adult ♀ grey lag, 38.0; adult ♀ Canadas, 43.3; juv. pinkfeet, 4.9; juv. gray lag, 3.0; juv. Canadas, 21.6. Most birds with pellets carried 1-5 shot, but 1 carried 23 shot.

Elder, William H. (U. Mo.) THE RELATION OF AGE AND SEX TO THE WEIGHTS OF PINK-FOOTED AND GREY LAG GEESE. 7th Ann. Rep. Wildfowl Trust: 127-132, 3 graphs. 1955.

In autumn of 1953, more than 1600 living British geese were weighed, aged by examination of tail tips, and sexed by eversion of vent. Results are graphed. It is shown for both species that adult ♂♂ were heaviest, followed in descending order by adult ♀♀, juv. ♂♂, and juv. ♀♀. Data on weights of these species are summarized from the literature. Published weights tended to run higher than those of the present study; part of the explanation for this is that many earlier data were based on spring shooting and some were based on other races of the species.

Engelmann, C. EXPERIMENTS ON THE SEEING ABILITY OF THE GOOSE. Z. Tierpsychol. 12(2): 266-276. 1955. [Abstract by F. M., Auk 73(20).]

In German. "English summary. Experiments on domestic geese, ducks, and chickens show the distances at which they recognize a white plate, grain, and fellow members of their species. Geese see distant goals better than chickens or ducks, but chickens are best at recognizing objects which are quite near."

Evans, Charles D., and Kenneth E. Black. (US F&WS.) DUCK PRODUCTION STUDIES ON THE PRAIRIE POTHOLES OF SOUTH DAKOTA. US F&WS, Spec. Sci. Rep.--Wildl. no. 32. ii + 59 p., 23 figs. Mar. 1956.

Significant contribution to knowledge of waterfowl use of potholes and importance of potholes. The study was made on an 11.25 sq. mi. study area near Waubay, S. Dak., 1950-53. Chapter headings of the paper are: Description of the area, Duck populations, Pothole utilization, Mobility of ducks in the breeding season, Use of the habitat and the limiting factors, Effect of the present drainage program on duck production, Conclusions, and Methods. Much information is given on nesting and travels in relation to potholes of various types and locations. Av. production on the area was 140 young per sq. mi. All types of potholes were of nearly equal value. Small, temporary ponds--the type now being drained--are of great value for pairing and nesting. Larger ponds serve a number of functions, especially for brood rearing. Drainage of any of the water areas reduces both carrying capacity for pairs and production. Agricultural authorities state that the best use of this land is for grass and cover crops. The subsidized drainage program is delaying a shift to such use and is helping to perpetuate present cropping practices.

Fabricius, Eric, and Hugh Boyd. EXPERIMENTS ON THE FOLLOWING-REACTIONS OF DUCKLINGS. 6th Ann. Rep. Wildfowl Trust: 84-89. 1954.

Frary, Ladd G. WATERFOWL PRODUCTION ON THE WHITE RIVER PLATEAU, COLORADO. M. S. thesis, Colo. A & M Coll. 93 p., illus. Mar. 1954.--L. E. Yeager.

Grice, G. D., Jr., E. L. Tyson, and E. B. Chamberlain, Jr. (Fla. State U.) AN UNEXPLAINED MORTALITY OF CANADA GEESE IN NORTH FLORIDA. J. Wildl. Mgt. 20 (3): 330-331. July 1956.

Death of numerous Canada geese was discovered on a receding pond north of Tallahassee in Feb. 1954. The area of this pond was about 5 acres, the depth not more than 2 ft. Water tests showed a pH of 7.4 and a calcium carbonate content of 11.0 ppm. Large numbers of dinoflagellates (Peridinium volzi) were found; their concentration dropped from 2,738 per cc. on 25 Feb. to 12 per cc. on 19 April. This organism is quite close to the causative agent of "Red Tide," and while the evidence is not conclusive, indications are that it could be responsible for the goose mortality. Mud and water samples tested for Clostridium botulinum were negative. Pond water injections in baby chicks and guinea pigs caused no ill effects. No fowl cholera occurred in farm fowl in the area. Gross post-mortems revealed no unusual conditions.--E. B. Chamberlain, Jr.

Hammond, M. C., and William R. Forward. (US F&WS, Upham, S. Dak.) EXPERIMENTS ON CAUSES OF DUCK NEST PREDATION. J. Wildl. Mgt. 20(3): 243-247. July 1956.

Several types of observer-introduced bias in duck-nesting studies are discussed. An erroneously high nesting success is reported when length of observation time is not correlated with total time of exposure to predation. This often may be masked by an increase in rate of predation on the studied sample owing to activities of field workers in locating, marking, and revisiting nests. When a duck is flushed from a nest, it often deposits feces at nest site. This adds appreciably to chances of later discovery of nest by certain mammals. Consideration for these factors suggests that while nest studies may have value for analyzing density, distribution, and cover, they may not furnish reliable information about production.--M. C. Hammond.

Herman, Carlton M. (Patuxent Refuge, Laurel, Md.) HAEMOPROTEUS INFECTIONS IN WATERFOWL. Proc. Helminth. Soc. Wash. 21(1): 37-42. Jan. 1954.

Taxonomy, transmission, hosts.

Holmer, Matts. OBSERVATIONS ON THE GOOSANDER IN THE RIVER INDAL. Vår Fågelvärld 14(4): 231-235. 1955. [From long abstract by Louise de K. Lawrence, Bird-Banding 27(3).]

In Swedish. On Mergus merganser in ne. Sweden. Interesting notes on habitats, use of artificial nesting sites such as buildings, distances broods travel to water, clutch sizes, behavior of mothers and broods, feeding behavior of young and adults.

Jahn, Laurence. (Wis. Cons. Dept.) CANADA GEESE LISTED AS "VERMIN" IN NEW ZEALAND. Modern Game Breeding & Hunting Club News 26(5): 15. May 1955.

Introduced Canada geese thrive in N. Z. and there are nonmigratory. The objection to them is that they compete with sheep for grass. They occupy rather inaccessible lake country and are seldom taken by hunters. Drives occasionally are organized to control the geese.

Jones, N. G. Blurton, and Robert Gillmor. OBSERVATIONS ON GATHERING AND DEPARTURE OF PINK-FOOTED GEESE AT ASGARD IN CENTRAL ICELAND. 7th Ann. Rep. Wildfowl Trust: 153-169, 6 figs. 1955.

Data on local movements, migratory movements, weather conditions that influence these movements, and brood sizes.

Kirkman, Roger L. AN EVALUATION OF WATERFOWL PRODUCTION ON LAKES IN NORTH PARK, COLORADO. M. S. thesis, Colo. A & M Coll. 95 p., illus. Feb. 1956.--L. E. Yeager.

Lagler, Karl F. (U. Mich.) THE PIKE, ESOX LUCIUS LINNAEUS, IN RELATION TO WATERFOWL ON THE SENEY NATIONAL WILDLIFE REFUGE, MICHIGAN. J. Wildl. Mgt. 20 (2): 114-124. Apr. 1956.

Habitat favorable to pike and waterfowl was created by flooding parts of the refuge, 1936-42. Within 5 years, pike appeared in all 19 pools in numbers up to at least 22 per acre (exclusive of young-of-year) and av. between 19 and 20 in. in length. Fish and crayfish were by far the most important and most consistently eaten food of 1841 pike 12 in. or more in length. Young waterfowl were present in only 3 of 1218 pike 14 in. or more long collected during the 90-day waterfowl brooding season. Percentage frequency of ducklings in this lot of pike was thus about 0.2. Pike were profoundly influenced in their feeding by availability of small forage minnows, on which they gorged during a control experiment with rotenone. Pike spurned tethered ducklings in natural waters and free-swimming ducklings in an experimental enclosure when the birds were offered for brief periods. Control methods for pike which were tried and which, when properly regulated, were commensurate with marsh- and water-bird production, were gill netting, seining, trapping, poisoning, dynamiting, and angling. All things considered, angling seemed best were control required.--K. F. Lagler.

Lindroth, Arne. MERGANSERS AS SALMON AND TROUT PREDATORS IN THE RIVER INDALSÄLVEN. Ann. Rep. for Year 1954 and Short Papers, Inst. Freshwater Res., Rep. no. 36, Fishery Bd. Sweden. p. 126-132. 1955. [From Sport Fishery Abs. 1(4).]

Author's abstract: "Stomach analysis of 23 shot Mergus merganser and 2 M. serrator show that...in northern Sweden these birds feed mainly upon salmon, trout and miller's thumb, the two former species contributing at least 50 percent of the food. A rough estimate indicates that the merganser population in 1954 may have consumed about 350,000 10-gram salmon (or trout) parr, the mean annual smolt production of the river being estimated at about 300,000 individuals."

Notini, Gösta, and Hans Westman. SEA BIRDS AND SEA BIRD SHOOTING BY THE SWEDISH EAST COAST (Sjöfågeln och Sjöfågeljakten längs Ostkusten). Kungl. Skogshögskolans Skrifter (Bul. Roy. Sch. For., Stockholm) no. 22. 1-77 p., illus. 1956. Price kr. 3.

In Swedish with 2.5 p. English summary. Study of effect of regulations of 1950, which limited spring shooting and gave eider total protection in spring. Eider (S. mollissima) has increased substantially. Velvet scoter (M. fusca), which arrives so late it is scarcely affected by legal spring shooting, shows little change. Long-tailed duck (old squaw) is still declining, probably because of oil pollution in part. The garrot (goldeneye, B. clangula) is declining and spring shooting of it probably should be reduced. Tufted duck

(A. fuligula) has increased locally. Common and red-breasted mergansers have shown little change despite increased pressure on them. Black scoter has declined. Drawbacks of spring shooting are loss of breeders, higher risk of wounding than occurs in fall, and serious disturbance to breeding. Proposals to shoot only males in spring are impracticable because sportsmen could not distinguish the sexes and because males are needed for breeding. It would be all right to shoot males after breeding, but this would require special circumstances that are lacking. Shooting in Denmark takes the bulk of the sea-bird production of other Scandinavian countries, so Swedish shooters have a fair claim to a good bag. The authors feel, however, that spring shooting should be further restricted or even banned, with compensation being made by permission for prolonged fall and winter shooting along the coast.

O'Meara, David C. (U. Maine.) BLOOD PARASITES OF SOME MAINE WATERFOWL. J. Wildl. Mgt. 20(2): 207-209. Apr. 1956.

Microscopic examination of Giemsa-stained blood smears taken from 824 ducks of various species revealed that: (A) Leucocytozoon spp. occurred in 9% of black ducks sampled and 67% of wood ducks. (B) Haemoproteus spp. occurred in 9% of black ducks sampled and 67% of wood ducks. (C) Microfilaria spp. were found in 28% of black ducks and 18% of wood ducks. Single, double and triple infections were observed. A wide variation of infection was found in duplicate smears. Additions to the reported hosts for Leucocytozoon, Haemoproteus, and Microfilaria are listed.--D. C. O'Meara.

Over, H. J., and M. F. Mörzer Bruijns. WATERWILDCONCENTRATIES IN NEDERLAND IN FEBRUARI 1956. De Levende Natuur 59(7): 149-155, 1 map. 1956.

Paludan, Knud, and Jørgen Fog. THE DANISH BREEDING POPULATION OF WILD LIVING CYGNUS OLOR IN 1954. Danske Vildtundersøgelser, Hefte 5. 1-46 p., 5 figs. 1956.

In Danish with long English summary. In 1925 only 3-4 pairs of mute swans were breeding in Denmark. Full protection was given in 1926 and by 1954 there were about 758 pairs. Rate of increase was 18.4% per year. Much information is given on clutch size, hatching success, productivity, and probable mortality. Some hunters claim that the swans are injurious to duck populations. Apparently this can occur under some situations, but in general the mute swan is of no importance to the Danish duck population. There is some agitation for opening the season on swans. The number of birds is not considered adequate for hunting, but if the swans are to be hunted, opening the season only in alternate years would provide a certain amount of safety.

Robinson, Harry A. MIGRATORY WATERFOWL AGRICULTURAL CROP DEPREDATION CONTROL IN NORTHEASTERN COLORADO. M. S. thesis, Colo. A & M Coll. 180 p., illus. May 1956.--L. E. Yeager.

Schiller, Everett L. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) SOME CESTODE PARASITES OF THE OLD-SQUAW, CLANGULA HYEMALIS (L.). Proc. Helminth. Soc. Wash. 22(1): 41. Jan. 1955.

Scott, Peter, editor. THE FOURTH ANNUAL REPORT OF THE SEVERN WILDFOWL TRUST 1950-1951. Publ. for Severn Wildfowl Trust by Country Life Ltd., 2-10 Tavistock St., Covent Garden, London, W. C. 2., Eng. 1952? 10s. net.

A paper by Hugh Boyd tells of experiments in use of paints and dyes to mark geese. Peter Scott continues his series on waterfowl of British Isles with paintings and accounts of dabbling ducks and shelducks. Four plates in color depict both sexes and various plumages of the 13 species, several of which are American. The brief species accounts list ssp. and outline habits and recognition characters. Other features of the volume include a series of fine photographs of waterfowl and waterfowl work, data on numbers of geese using the grounds of the Trust, records of banding and recoveries, living waterfowl in the collection, data on hatching and rearing, causes of deaths, and material on work and membership of the Trust.

Scott, Peter, editor. THE FIFTH ANNUAL REPORT OF THE SEVERN WILDFOWL TRUST 1951-1952. Publ. for Severn Wildfowl Trust by Country Life Ltd., 2-10 Tavistock St., Covent Garden, London, W.C.2, Eng. 191 p., illus. 1953? 10s. net.

Technical papers in this report include: Notes on field counts of age-group ratios and brood-size [in European white-fronted geese], by Hugh Boyd; Notes on the relative mortality of adult and young pink-footed geese, by Hugh Boyd; Incubation and hatching behavior in the mallard, by D. F. McKinney; The American boom trap, by Peter Scott; and The Severn Wildfowl Trust Expedition to Central Iceland, by Peter Scott, James Fisher, and Finnur Gudmundsson. Scott continues his series on waterfowl of the British Isles with a section on diving ducks, mandarin duck, and eiders. This section has 3 good colored plates that show all species; the text presents list of ssp. and brief data on habits and recognition. The volume also contains much data on numbers of wild birds that visited the grounds of the Trust, banding and recoveries, living waterfowl in the collection, tables on rearing success, care of the birds, narrative accounts of work in Iceland, affairs of the Trust, and a series of photographs of waterfowl and field work of the Trust in Iceland and elsewhere.

Scott, Peter. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) THE AMERICAN BOOM TRAP. 5th Ann. Rep. Severn Wildfowl Trust: 72-77. 1951-52.

Good comparison of advantages and disadvantages of cannon net traps with those of rocket net traps. One main conclusion is that rockets are better than mortars when large nets must be used to cover large areas over which birds are spread out. Notes are given on the cordite-propelled rockets being developed in Britain.

Scott, Peter, and Hugh Boyd, editors. THE SIXTH ANNUAL REPORT OF THE WILDFOWL TRUST 1952-1953. Publ. for Wildfowl Trust by Country Life Ltd., 2-10 Tavistock St., Covent Garden, London, W.C.2, Eng. 162 p., illus. 1954. 10s. net.

Technical papers of this volume include: Effects of aureomycin on the growth of ducklings, by Hugh Boyd; Behavior of the Bolivian torrent duck, by Peter Scott; White-fronted goose statistics, 1952-53, by Hugh Boyd; Hostile encounters between wild white-fronted geese in winter flocks, [summary only], by Hugh Boyd; Experiments on the following-reaction of ducklings, by Eric Fabricius and Hugh Boyd; and Some results of recent British mallard ringing, by Hugh Boyd. Scott concludes his series on waterfowl of the British Isles with accounts and 3 color plates of scoters, other sea ducks, and mergansers. As before, the plates show both sexes and various plumages and the brief accounts list ssp., summarize habits, and supply recognition data. Scott also has an interesting narrative account of his recent studies of waterfowl and other birds in several parts of South America. Other parts of the volume report use of the grounds by wild birds, living waterfowl in the collection, hatching and rearing success, methods of caring for the birds, disease problems in the collection, banding and recoveries of geese and ducks, and other material. There is also a good series of photographs of waterfowl, some of them in their South American habitats.

Scott, Peter, and Hugh Boyd, editors. THE SEVENTH ANNUAL REPORT OF THE WILDFOWL TRUST 1953-1954. Publ. for Wildfowl Trust by Country Life Ltd., 2-10 Tavistock St., Covent Garden, London, W.C.2, Eng. 235 p., illus. 1955. 10s. net.

This issue contains an exceptionally large number of technical papers, most of which are listed separately in this number of WR. It also contains information on wild birds using the grounds of the Trust, accounts of rearing success in the collection, reports on banding work, data on recoveries of banded geese and ducks, narratives of banding and other work with geese in Iceland and Spitsbergen, discussion of the new Protection of Birds Act, brief accounts of numbers of brent geese in Europe and of the oil pollution problem, affairs of the Trust, and other material. As usual, there is a good series of photographs. These show waterfowl and work with them in Iceland and Britain.

Scott, Peter, Hugh Boyd, and W. J. L. Sladen. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) THE WILDFOWL TRUST'S SECOND EXPEDITION TO CENTRAL ICELAND, 1953. 7th Ann. Rep. Wildfowl Trust: 63-98, illus. 1955.

Great success in banding large numbers of pink-footed geese was achieved by herding flightless birds into temporary pens of netting. Methods of capturing and marking are discussed. 4444 adults and 4861 goslings were caught. 260 adults had been marked in previous years. The breeding colony was estimated from recapture data to consist of 8200 adults and 10,200 goslings. Few yearlings were captured. Numbers of 2-year-old birds were distributed throughout the colony but probably were not breeding. Attempts to measure losses of goslings are described. It appears that losses between hatching and entry into the British population amounted to about 3/5 of goslings hatched. Losses of this magnitude are consistent with the estimated replacement rate necessary to maintain the species at its present level. Length of flightless period was found to be about 25 days, shorter than previously thought. Data on other birds are given and a list of plants, with indications of abundance, is appended.

Scott, Peter, James Fisher, and Finnur Gudmundsson. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) THE SEVERN WILDFOWL TRUST EXPEDITION TO CENTRAL ICELAND, 1951. 5th Ann. Rep. Severn Wildfowl Trust: 78-115, illus. 1951-52.

Summary: "A party of four assisted by Icelandic farmers spent five weeks... at what may prove to be the world's largest breeding colony of Pink-footed Geese (Anser brachyrhynchus). The history of this and other breeding colonies is outlined... Studies were mainly concentrated on marking, with a view to population measurement, and on behaviour. It was estimated that there were probably about 2300 nests in the oasis and that the population including adults and goslings may have been of the order of 13,000 birds. Recaptures of marked birds were used in making these estimates. Food, predation, nests, eggs and goslings, behaviour of parents and broods are described and discussed. Methods of capture were discovered which throw light on the functions of ancient ruined 'goose-folds' found in the area. Five large drives were made, in one of which 267 geese were caught. During the whole period 1151 geese and goslings were marked, some with Swedish-type wing-tags. A list with notes on status and behaviour of thirty-two species of birds seen in the oasis is followed by notes on invertebrates, flowering plants and hot springs."

Sladen, W. J. L., and P. K. C. Austwick. THE MYCOFLORA OF WILD PINK-FOOTED GEESE SAMPLED IN ICELAND AND SCOTLAND, 1953. 7th Ann. Rep. Wildfowl Trust: 133-138. 1955.

Summary: "An attempt was made, (i) to study the fungi isolated from the upper respiratory tracts of wild Pink-footed Geese at their breeding-grounds in Iceland and at their winter quarters in Scotland, in order to discover whether they harboured Aspergillus fumigatus in the wild, and (ii) to test suitable methods for collecting samples in the field under adverse conditions. Cultures were made by streaking throat-swabs on to Sabouraud's dextrose agar slopes and neither these nor the controls revealed A. fumigatus or any other potential pathogenic fungus, but the isolates obtained showed that the quality and quantity of the fungus content of the upper respiratory tracts of the geese may be dependent on their environment. Suggestions are made for improving technique. A species of Ascomycete grown from the throats of three geese in Iceland appears to be new to science." Types of fungi found are listed.

Steel, Paul E., Paul D. Dalke, and Elwood G. Bizeau. (US F&WS, Othello, Wash.) DUCK PRODUCTION AT GRAY'S LAKE, IDAHO, 1949-1951. J. Wildl. Mgt. 20(3): 279-285, 1 map. July 1956.

Gray's Lake in se. Idaho is a 22,000-acre marsh at 6,386' elevation. It averages 3' in depth and is 90% covered with emergent vegetation. Principal duck species in 1949-1951 were mallard, pintail, red head, blue and green-winged teal, canvas back, gadwall, lesser scaup and ruddy. Nesting success was 70%. Egg success was 88%. Major cause of egg failure was death of embryos during incubation. Duck production declined from 47 nests per 100 habitat acres in 1949 to 39 in 1950 and 15 in 1951. Waterfowl mortality from spring muskrat trapping was not significant; 1% of the duck population was trapped in 1950 and 2% in 1951.--P. D. Dalke.

Sutton, George M., and David F. Parmelee. (U. Okla.) ON CERTAIN ANATIDS OF FROBISHER BAY, BAFFIN ISLAND. Arctic 8(3): 138-147, 3 photos, 1 col. pl. 1955 [1956].

Miscellaneous observations on activities, localities, molt, color, identification (the Canada geese may be B. c. interior), foods, etc., of 7 species.

Tester, John Robert. WATERFOWL PRODUCTION IN BROWN'S PARK, COLORADO. M. S. thesis, Colo. A & M Coll. 98 p., illus. Nov. 1953.--L. E. Yeager.

Weller, Milton W. (U. Mo.) A SIMPLE FIELD CANDLER FOR WATERFOWL EGGS. J. Wildl. Mgt. 20(2): 111-113, 1 fig. Apr. 1956.

When egg is viewed against sky through opening of cardboard mailing tube, developmental changes can be seen which indicate age of embryo. Eggs of 4 species of ducks (Aythya americana, Aythya valisneria, Anas acuta, and Anas platyrhynchos) were kept in an incubator and examined every 4 days to establish age criteria.--M. W. Weller.

Weller, Milton Webster. PARASITIC EGG LAYING IN THE REDHEAD (AYTHYA AMERICANA) AND OTHER NORTH AMERICAN ANATIDAE. Ph. D. thesis, U. Mo. 160 p. 1956.

Yelverton, Carl Spencer. FOOD HABITS OF THE CANADA GOOSE, BRANTA CANADENSIS LINNAEUS, AT LAKE MATTAMUSKEET, NORTH CAROLINA. M. S. thesis, N. C. State Coll. vi + 201 p., 4 figs. 1956.

Data are based on contents of 263 gizzards and 31 gullets. Principal foods taken were: culms and roots of Eleocharis olivacea and E. parvula, rhizomes and roots of Scirpus americanus, and grains of corn. Soy beans, an important crop in the area, and Chara and Nitella, both very abundant in the lake, occurred only sparingly. The author gives a comprehensive review of the literature pertaining to food habit studies and discusses the history and vegetation of Lake Mattamuskeet.--C. G. Webster.

Yocom, Charles F. (Humboldt State Coll.) MAN-MADE HOMES FOR CANADA GEESE. Aud. Mag. 58(3): 106-109, 127, 6 photos. May-June 1956.

Tells how well geese have taken to nesting in tubs, platforms and other artificial structures placed in trees along Wash. rivers. The program was conceived and executed by private individuals. Apparently local goose breeding has been considerably increased. Young geese jump from the nests when called by parents.

CRANES, RAILS, SHOREBIRDS

Latham, Roger M. (Pa. Game Comm.) MIDWINTER COURTSHIP FLIGHTS OF WOODCOCK IN DELAWARE. J. Wildl. Mgt. 20(2): 209. Apr. 1956.

Three male woodcocks were sighted in courtship flight on Jan. 8, 1955 near Petersburg, Del., when the temp. was 25°F. and all surface water and soil were frozen. Birds were apparently wintering that far north (39° parallel).--R. M. Latham.

Meanley, Brooke. (US F&WS, P. O. Box 1365, Alexandria, La.) FOOD HABITS OF THE KING RAIL IN THE ARKANSAS RICE FIELDS. Auk 73(2): 252-258, 1 fig. Apr. 1956.

Based on analysis of contents of 118 gizzards and on numerous observations, 1950-55. Rails fed mostly around canals and streams in cooler months, but largely in rice fields in summer. Most active feeding was in early morning and in late afternoon or evening. Animals comprised 79% by volume of the food. Crayfish were main food, but fish became important when available in drying fields. Various insects were also important foods. Rice seeds were chief vegetable food. Weed seeds were eaten often but generally in trace amounts.

Westfall, Claude Z., and Robert B. Weeden. (U. Maine.) PLASTIC NECK MARKERS FOR WOODCOCK. J. Wildl. Mgt. 20(2): 218-219, 2 figs. Apr. 1956.

Colored plastic neck markers were applied to 25 trapped woodcock using Michels' "Justrite" non-corrosive 14 mm. wound clips. Markers remain on birds for at least 3 weeks and are useful primarily for short-term studies involving movements of woodcock during breeding season.--C. Z. Westfall.

Broun, Maurice. (R. D. No. 2, Kempton, Pa.) PENNSYLVANIA'S BLOODY RIDGES. Nat. Mag. 49(6): 288-292, 6 photos. June-July 1956.

All but 3 kinds of hawks are supposed to be legally protected in Pa. Every year, however, thousands upon thousands of migrating hawks are shot from scores of blinds along the ridges. Most of these hawks are of protected species. Hawk shooting is not only a sport, it is virtually a passion, and hundreds of people indulge in it. Some of the largest and most-used blinds are on state game lands. Convictions are exceedingly rare and difficult to obtain. The author maintains that aside from posting signs the Pa. Game Comm. has done very little to stop the slaughter, even on its own lands.

Dunnet, G. M. (Wildl. Surv. Sect., CSIRO, Nedlands, W. Australia.) THE AUTUMN AND WINTER MORTALITY OF STARLINGS STURNUS VULGARIS, IN RELATION TO THEIR FOOD SUPPLY. Ibis 98(2): 220-230, 5 graphs. Apr. 1956.

Study of foods, weights, and seasonal mortality in Scotland.

Eipper, Alfred W. (Cornell U.) DIFFERENCES IN VULNERABILITY OF THE PREY OF NESTING KINGFISHERS. J. Wildl. Mgt. 20(2): 177-183, 1 fig. Apr. 1956.

Fish and crayfish were equally abundant in food remains from each of 2 kingfisher nests excavated soon after desertion by the birds. Total numbers of food organisms represented (by identifiable bones) in the 2 nests were 325 and 462. Rhinichthys spp. comprised 6% and Campostoma anomalum 54% of fishes in the nest remains, but 77% and 5% respectively, of fishes in the adjacent stream. All crayfish in the nest remains were Cambarus spp., whereas the stream crayfish population consisted of 27% Cambarus spp. and 73% Orconectes sp. Analyses of data indicate that differences in vulnerability of food organisms to kingfisher predation were in part attributable to size selectivity by foraging birds and to vulnerability of certain prey occasioned by their spawning or post-spawning behavior.--A. W. Eipper.

James-Veitch, Elden, and Ernest S. Booth. BEHAVIOR AND LIFE HISTORY OF THE GLAUCOUS-WINGED GULL. Walla Walla Coll., Publ. Dept. Biol. Sci. no. 12. Pages and price not stated. 1954. [From highly critical review by Zella M. Schultz, Murrelet 37(1).]

"The writers spent the summers of four years accumulating the data presented... This paper is a survey of the breeding season only... Behavior is in many cases described, but does not include any interpretation of the actions involved... [The paper] is primarily a contribution to our knowledge of the behavior of the birds during the growth period. It is far from exhaustive..."

Johnston, David W. (Mercer U.) THE ANNUAL REPRODUCTIVE CYCLE OF THE CALIFORNIA GULL. II. HISTOLOGY AND FEMALE REPRODUCTIVE SYSTEM. Condor 58(3): 206-221, 2 figs. May-June 1956.

"The first part of this paper dealing with the criteria for age determination in the California Gull..., with the size of the testes and seminiferous tubules, and with the stages of spermatogenesis appeared in the preceding issue of the Condor... The conclusion of this work concerns further phases of the male reproductive cycle, namely, intertubular histology of the testis, incubation patches, and subadult breeding, and it presents data on the female reproductive cycle. Also included in Part II is a general summary."

Jumber, Joseph F. (Pa. State U.) ROOSTING BEHAVIOR OF THE STARLING IN CENTRAL PENNSYLVANIA. Auk 73(3): 411-426, 7 graphs. July 1956.

Roosting sites, flight lines, pre-roosting areas, environmental factors that govern time of roosting, and permanence of roosts.

Phillips, Richard E., and Hugh C. Black. (415 N. Court St., Crown Point, Ind.) A WINTER POPULATION STUDY OF THE WESTERN WINTER WREN. Auk 73(3): 401-410, 2 graphs. July 1956.

Daily range, roosting habits, population density, and relation of habitat type to density.

Platt, Dwight. FOOD OF THE CROW, CORVUS BRACHYRHYNCHOS BREHM, IN SOUTH-CENTRAL KANSAS. U. Kans Publ., Mus. Nat. Hist., 8(8): 477-498. June 1956.
Based on analysis of 617 regurgitated pellets collected from roosts and lookout posts. Results are tabulated and discussed in detail. "Plant material amounted to 69.0 per cent of the pellet residues. Wheat is the food taken in greatest amount in the yearly average, but the staple foods of the wintering crows are grain sorghum, sunflower seeds, and corn. Crows use newly sown oat fields as a major source of food in late winter and early spring, but damage to the crop seems to be slight. Growers of grain sorghum and, locally, growers of corn and watermelons, sustain serious damage from crows. Being euryphagous, crows exert a stabilizing influence on many kinds of prey and on the biotic community as a whole. This study indicates that their effects are especially important in helping to stabilize the populations of grasshoppers and of ground-dwelling beetles, and possibly those of some other insects that have soil-dwelling larvae. Carrion and material from dumping grounds furnish another fairly constant component of the crow's diet."

Rice, Dale W. (US F&WS, Denver 2, Colo.) DYNAMICS OF RANGE EXPANSION OF CATTLE EGRETS IN FLORIDA. Auk 73(2): 259-266. Apr. 1956.

Sutton, George M., and David F. Parmelee. (U. Okla.) BREEDING OF THE SNOWY OWL IN SOUTHEASTERN BAFFIN ISLAND. Condor 58(4): 273-282, 3 photos. July-Aug. 1956.
Clutch-size, hatching success, nest sites, size and shape of territories, attacks on observers, call notes, hatching period, development of young, foods.

Thorne, Oakleigh, II. DIFFERENCES BETWEEN THE COMMON HOUSE FINCH AND CASSIN'S PURPLE FINCH OF THE GENUS CARPODACUS. Thorne Ecol. Res. Sta. (1707 Hillside Rd., Boulder, Colo.), Bul. no. 3. 1-4 p., 2 figs., proc. May 1956.
Recognition characters of value to bander and field man.

Vietinghoff-Riesch, A. THE BARN SWALLOW (Die Rauchschwalbe). Duncker & Humblot, Schleisheimer Strasse 68, München 13, Germany. xvi + 302 p. 1955. 24 DM. [From review by D. S. Farner, Bird-Banding 27(3).]
An extensive and detailed compilation of information on many aspects of the biology of the barn swallow in all parts of the species' range. Farner's review lists topics treated and summarizes some of the conclusions.

REPTILES AND AMPHIBIANS

Allen, E. Ross, and Wilfred T. Neill. (Reptile Inst., Silver Springs, Fla.) EFFECT OF MARINE TOAD TOXINS ON MAN. Herpetologica 12(2): 150-151. May 1956.

Bevans, Michael H. THE BOOK OF REPTILES AND AMPHIBIANS. Garden City Books, Garden City, N. Y. 1-63 p., illus. 1956. $2.50.
A high level of accuracy and many good colored drawings by the author make this a recommended beginner's guide to U. S. reptiles and amphibians. Its 8.5 x 11 in. pages all have from 1 to several pictures, each in color, and accompanying text. The pictures vary from excellent to ordinary but are generally very satisfactory. The text for a species or group is brief and simple but full of good information on habits and ranges. Coverage of the fauna is, of course, highly selective, with common or well-known animals given most attention. Some large genera such as Bufo, Plethodon, and Cnemidophorus are represented by 1 or 2 species and many little-known genera are omitted. The book should be attractive and useful to youngsters and others whose interest in nature is superficial. The only thing about it that irritated the reviewer was the use of the terms variety, color phase, and subspecies, all to mean subspecies.

Bogert, Charles M., and Rafael Martin del Campo. (Am. Mus. Nat. Hist., N. Y.) THE GILA MONSTER AND ITS ALLIES / THE RELATIONSHIPS, HABITS, AND BEHAVIOR OF THE LIZARDS OF THE FAMILY HELODERMATIDAE. Am. Mus. Nat. Hist., Bul., 109(1): 1-238 p., 35 figs., 2 maps, + 20 plates. Apr. 1956. $4.00.
An encyclopedic treatment of the 2 species of Gila monsters and their 5 subspecies. The monograph is elaborately illustrated and documented. Virtually everything known about the only venomous lizards in the world is reviewed in

detail and much original research is reported. Most readers would have no need for any other source of information on the group. The volume begins with taxonomy and variation and moves on to foods and feeding, bodily functions and activities, reproduction, growth, thermal and moisture relationships, enemies, adaptiveness of coloration, venom apparatus and venom, effects of venom on various animals, accounts of bites in people, folklore and misinformation, and other topics. The authors conclude from many case reports that bites of Gila monsters can be dangerous to man, perhaps lethal. They do not believe that Gila monsters are in any real danger of extermination, for their chief habitat is relatively undisturbed.

Bragg, Arthur N. (U. Okla.) FURTHER OBSERVATIONS ON SPADEFOOT TOADS. Herpetologica 12(3): 201-204. Sept. 1956.
Breeding, tadpole behavior, and tadpole growth of S. holbrooki hurteri in Okla.

Committee on Herpetological Common Names. COMMON NAMES FOR NORTH AMERICAN AMPHIBIANS AND REPTILES. Copeia 1956(3): 172-185. Aug. 1956.
Standardization of common names is an acute need in popular writing and for other purposes. The Committee has performed a genuine service in preparing this list and it is to be hoped that everyone will follow it as far as his convictions permit. The Committee followed usage and avoided invention of new names as far as possible. This led to perpetuation of the objectionable name "milk snake" and to entirely dissimilar names for certain subspecies. For example, Lampropeltis c. calligaster is called "Prairie Kingsnake" while L. c. rhombomaculata is called "Mole Snake." One cannot help feeling that a little more innovating and systematizing would have given more satisfactory results even if usage had to be disregarded here and there. A highly practical feature of the list is provision of English names for each genus and each full species. Thus all forms of Elaphe can be referred to collectively as "Rat Snakes" and all forms of Elaphe guttata can be called "Corn Snakes." Contrary to present policy in ornithology and mammalogy, a name is also listed for each subspecies. Probably this is necessary, for many herpetological races are sharply different. One cannot be entirely happy with the way it is worked out, however, when Elaphe g. guttata is called "Corn Snake," E. g. emoryi is called "Great Plains Rat Snake," and a third race, E. g. rosacea, is called "Rosy Rat Snake." But such examples are not common; perhaps 95% of the list will be acceptable to any user. Those who chose to deviate from the list should have extremely constructive alternatives to offer.

Cunningham, John D. (U. Calif., Los Angeles.) FOOD HABITS OF THE SAN DIEGO ALLIGATOR LIZARD. Herpetologica 12(3): 225-230. Sept. 1956.

Davidson, John A. (Wash. Missionary Coll., Takoma Park, Md.) NOTES ON THE FOOD HABITS OF THE SLIMY SALAMANDER PLETHODON GLUTINOSUS GLUTINOSUS. Herpetologica 12(2): 129-131. May 1956.

Dumas, Philip C. (U. Idaho.) THE ECOLOGICAL RELATIONS OF SYMPATRY IN PLETHODON DUNNI AND PLETHODON VEHICULUM. Ecol. 37(3): 484-495, 3 figs. July 1956.
Unusually good study of ecological and competitive relationships of 2 related species in the same area. "Field observations were made of the temperature, relative humidity, and substratum moisture at the site of collection, the sex of each individual found and miscellaneous life history data. Concurrent laboratory studies were conducted to determine the food habits, time-temperature, time-humidity, and humidity-temperature-interspecific-crowding relations of each species of salamander. The slope and moisture perception of each species was tested." The species were found to differ only slightly in habitat tolerances. Their primary foods were similar but secondary foods varied. Food was too abundant to cause competition. There was competition for spots of high humidity, but there were more such spots than there were salamanders. "It appears that a relatively high mortality rate, due especially to adverse physical environmental conditions, keeps the total population of each species sufficiently low that the two species may co-exist in the same habitat with slight or no interspecific competition."

Einem, Gerald E. (Melbourne High Sch., Melbourne, Fla.) CERTAIN ASPECTS OF THE NATURAL HISTORY OF THE MUDTURTLE, KINOSTERNON BAURI. Copeia 1956(3): 186-188. Aug. 1956.
Habitat, reproduction, eggs, hatchlings, growth, and feeding.

Einem, Gerald E., and Lewis D. Ober. (Melbourne High Sch., Melbourne, Fla.) THE SEASONAL BEHAVIOR OF CERTAIN FLORIDIAN SALIENTIA. Herpetologica 12(3): 205-212. Sept. 1956.
Study of correlation between time of year, weather conditions, and calling of various species of frogs suggests that the season of potential breeding is very long in Fla. Data are also given on other aspects of behavior.

Fischtal, Jacob H. (Harpur Coll., Endicott, N. Y.) HELMINTHS OF SALAMANDERS FROM PROMISED LAND STATE FOREST PARK, PENNSYLVANIA. Proc. Helminth. Soc. Wash. 22(1): 46-48. Jan. 1955.

Fitch, Henry S. (U. Kans.) TEMPERATURE RESPONSES IN FREE-LIVING AMPHIBIANS AND REPTILES OF NORTHEASTERN KANSAS. U. Kans. Publ., Mus. Nat. Hist., 8(7): 417-476, 10 figs. June 1956.
An important account of body temperatures, season of activity, and seasonal activities of 29 species of amphibians and reptiles at the U. Kans. Nat. Hist. Reservation. A total of 1,577 temperature readings was obtained, most of them within the range of normal activity temperatures. Data are discussed species by species, with tables and graphs, and then in a summary section under the headings Seasonal Schedules, Optimum Temperatures and Ranges of Activity, and Dormancy. Considerable new and previously published information on hibernation sites is brought together.

Freeman, Harry W. (U. of S. C.) AN ECOLOGICAL STUDY OF THE LAND PLANTS AND COLD-BLOODED VERTEBRATES OF THE SAVANNAH RIVER PROJECT AREA. Part V. THE AMPHIBIANS AND REPTILES OF THE SAVANNAH RIVER PROJECT AREA. 1. CAUDATE AMPHIBIA. 2. CHELONIA. U. of S. C. Publ., Ser. 3, Biol., 1(4): 227-244. Jan. 1955.
Annotated lists with tables showing occurrence of species in the 3 counties of the Project Area and months of collections of species.

Freeman, Harry W. (U. of S. C.) AN ECOLOGICAL STUDY OF THE FAUNA AND FLORA OF THE SAVANNAH RIVER PROJECT AREA. Part V. THE AMPHIBIANS AND REPTILES OF THE SAVANNAH RIVER PROJECT AREA. 3. CROCODILIA, SAURIA AND SERPENTES. U. of S. C. Publ., Ser. 3, Biol., 1(5): 275-291. June 1955.
List of specimens. Tables show occurrence of species in the 3 counties of the Project Area and months of collections of species.

Freeman, Harry W. (U. of S. C.) AN ECOLOGICAL STUDY OF THE FAUNA AND FLORA OF THE SAVANNAH RIVER PROJECT AREA. Part V. THE AMPHIBIANS AND REPTILES OF THE SAVANNAH RIVER PROJECT AREA. 4. SALIENTIA. U. of S. C. Publ., Ser. 3, Biol., 2(1): 26-35. Mar. 1956.
List of specimens. Tables show occurrence of species in the 3 counties of the Project Area and months of collections of species.

Hamilton, W. J., Jr., and Joseph A. Pollack. (Cornell U.) THE FOOD OF SOME COLUBRID SNAKES FROM FORT BENNING, GEORGIA. Ecol. 37(3): 519-526. July 1956.
Summary: "The food of 367 colubrid snakes of 23 species...is recorded. Lizards are particularly abundant on the study area and are an important food of the larger snakes. Of 134 specimens of Coluber constrictor, Masticophis flagellum and Elaphe guttata, lizards had been eaten by 85 (63.4%). Snakes, mammals, amphibians and insects are the other primary foods. Tantilla appears to be a specific feeder, taking centipedes when these are available."

Hanson, Joe A., and James L. Vial. (U. Calif., Los Angeles.) DEFENSIVE BEHAVIOR AND EFFECTS OF TOXINS IN BUFO ALVARIUS. Herpetologica 12(2): 141-149, 2 photos. May 1956.

Harper, Francis. (115 Ridgway St., Mt. Holly, N. J.) AMPHIBIANS AND REPTILES OF THE UNGAVA PENINSULA. Proc. Biol. Soc. Wash. 69: 93-103, 2 photos. Sept. 1956.

Critical list of species; natural history and descriptive data on Bufo terrestris copei and Rana s. cantabrigensis; redefinition of boundary between Canadian and Hudsonian Life Zones in Ungava.

Hecht, Max K., and Daniel Marien. (Queens Coll., Flushing, N. Y.) THE CORAL SNAKE MIMIC PROBLEM: A REINTERPRETATION. J. Morph. 98(2): 335-356 + 4 plates. Mar. 1956.

After a detailed, technical review of the situation, the authors conclude, among other things, that the mimicry can be explained as convergent evolution of warning coloration by several groups of more or less venomous snakes, and imitation of these snakes by various harmless snakes. The mimicry is thought to have evolved because it has some selective value in protecting against predators with color vision, probably birds.

Highton, Richard. THE LIFE HISTORY OF THE SLIMY SALAMANDER, PLETHODON GLUTINOSUS, IN FLORIDA. Copeia 1956(2): 75-93, 8 figs. May 1956.

Much good information on such topics as season of reproduction, size of clutch, appearance and growth of young, activity of young, reproductive cycles of ♀♀ and ♂♂, age at maturity, and movements of marked individuals.

Malewitz, Thomas D. (Mich. State U.) INTESTINAL PARASITISM OF SOME MIDWESTERN SALAMANDERS. Am. Midl. Nat. 55(2): 434-436. Apr. 1956.

Report on acanthocephalans, trematodes, and protozoans found in 35 salamanders of the genera Ambystoma, Eurycea, Plethodon, and Cryptobranchus.

Martof, Bernard. (U. Ga.) THREE NEW SUBSPECIES OF LEUROGNATHUS MARMORATA FROM THE SOUTHERN APPALACHIAN MOUNTAINS. Occ. Pap., Mus. Zool., U. Mich. no. 575. 1-14 p., 1 map + 4 plates. July 1956.

On the basis of large series of fresh material from all parts of the range, Martof presents a revision in which 5 ssp. are recognized. Variation is described, ranges are mapped and discussed in terms of drainages, a key is provided, and good photographs depict the ssp.

McCallion, David J. (U. Toronto.) THE PAROTOID GLAND OF THE TOAD, BUFO AMERICANUS. Can. J. Zool. 34(3): 174-177, 11 figs. June 1956.

Histological and histochemical study.

Mullally, Don P., and John D. Cunningham. (San Mateo Jr. Mus., San Mateo, Calif.) ECOLOGICAL RELATIONS OF RANA MUSCOSA AT HIGH ELEVATIONS IN THE SIERRA NEVADA. Herpetologica 12(3): 189-198. Sept. 1956.

Distribution, habitat relationships, temperature relations.

Neill, Wilfred T. (Ross Allen Rept. Inst., Silver Springs, Fla.) ANOTHER DEVICE FOR COLLECTING LIZARDS. Copeia 1956(2): 123-124, 1 fig. May 1956.

Extremely simple rubber-band shooter that carries several bands ready for release.

Neill, Wilfred T., and E. Ross Allen. (Reptile Inst., Silver Springs, Fla.) SECONDARILY INGESTED FOOD ITEMS IN SNAKES. Herpetologica 12(3): 172-174. Sept. 1956.

Olson, R. Earl. (Bethel Coll., St. Paul, Minn.) THE AMPHIBIANS AND REPTILES OF WINNEBAGO COUNTY, ILLINOIS. Copeia 1956(3): 188-191. Aug. 1956.

Annotated list with locality data and remarks on variation and natural history.

Penney, James T. (U. of S. C.) DISTRIBUTION AND BIBLIOGRAPHY OF THE AMPHIBIANS AND REPTILES OF SOUTH CAROLINA. U. of S. C. Publ., Ser. 3, Biol., 1(1): 3-28. Nov. 1952.

List with county records and 7-page bibliography.

Reed, Clyde F. (10105 Harford Rd., Balt. 34, Md.) THE HERPETOFAUNA OF HARFORD COUNTY, MARYLAND. J. Wash. Acad. Sci. 46(2): 58-60. Feb. 1956.

Annotated list that gives locality records.

Scroggin, John B., and W. B. Davis. (Texas A & M Coll.) FOOD HABITS OF THE TEXAS DWARF SIREN. Herpetologica 12(3): 231-237. Sept. 1956.

Webb, Robert G. (U. Kans.) SIZE AT SEXUAL MATURITY IN THE MALE SOFTSHELL TURTLE, TRIONYX FEROX EMORYI. Copeia 1956(2): 121-122, 1 fig. May 1956.

FISHES

Harlan, James R., and Everett B. Speaker. (Iowa Cons. Comm.) IOWA FISH AND FISHING. 3rd edition. Iowa Cons. Comm., East 7th & Court Ave., Des Moines 9. viii + 377 p., illus. 1956. $2.50.

One of the finest and most generally useful fish books ever written and one of the best book bargains on the market. Like the first edition, it is the work of numerous authors, is valuable both to laymen and professionals, and is admirably illustrated. It has been revised and corrected throughout and 140 pages have been added. The first edition had chapters on Iowa's fishing waters, some common fish foods, and angling, as well as an introduction to fishes, several chapters on families and all Iowa species, a checklist, and a key. All of these are still present in revised form. A new chapter on natural baits and baiting has 32 drawings. A new chapter on fishing tackle has 69 drawings. Another new chapter, on fish distribution in Iowa, has 98 maps based on a vast amount of collecting. A section on state-owned access to fishing waters has been supplied. All sections, aside from the key, are written nontechnically. Dr. Reeve M. Bailey's excellent key, which is illustrated and has a glossary, has been improved with the aid of specialists. His checklist incorporates many taxonomic changes. Species accounts, which occupy 117 pages, provide data on common names, distribution in state, description, food habits, life history, and angling. Four halftone plates show 20 species of fish. The most attractive feature of the volume, however, is the splendid color plates by Maynard F. Reece. There are 18 of these, 9 of them new, illustrating 63 species. It is hard to see how they could be improved. The 9 original plates are reproduced even better than in the reviewer's copy of the first edition. The 18 color plates are available separately on 2 posters or in a portfolio, either of which is $2.00 a set.

INVERTEBRATES

Usinger, Robert L., editor. AQUATIC INSECTS OF CALIFORNIA / WITH KEYS TO NORTH AMERICAN GENERA AND CALIFORNIA SPECIES. U. Calif. Press. ix + 508 p., illus. 1956. $10.00, cloth.

This great work by 16 authorities is well worth its cost if only because it makes possible the identification to genus of all aquatic insects of America north of Mexico. It is a large volume with 8.5 x 11 in. pages of 2 columns each. It has many beautiful drawings of entire insects and hundreds of drawings of details. Most of the book consists of keys to adults and larvae of the various groups. California species are keyed out insofar as knowledge permits. Use of keys is facilitated by drawings, references that are cited for each group, and a glossary. Orders and families are introduced by informative discussions of general habits, relationships, biology, life history, habitats, and taxonomic characters. The work thus serves as an excellent general reference on aquatic insects as well as providing for identification. The 67-page introduction, "Written from the ecological point of view, presents the basic concepts of limnology as they apply to insects; the various aquatic habitats of California are described and original classifications are proposed for the streams and lakes of the state. The introduction also deals with the applied aspects of aquatic entomology as they affect mosquito control, irrigation, pollution, pond and game fish culture, and stream and lake management. Techniques of collecting, mounting, and rearing aquatic insects are explained; commonly used techniques of the entomologist are thus brought to the attention of limnologists, and standard limnological methods are brought to the attention of entomologists." In all, the volume is a gold mine for anyone concerned with aquatic insects.

BIBLIOGRAPHY OF W. L. McATEE'S PAPERS ON VERNACULAR NAMES

Anyone who has worked with lay reports (of banded birds, for example) or with historical records, knows the importance of having reliable interpretations of vernacular names. The leading student in this field is Mr. W. L. McAtee, who was a biologist and administrator in the Biological Survey and the Fish and Wildlife Service from 1904 to 1947. He was the founder of Wildlife Review and was the editor from its inception in 1935 through 1947. It was once hoped that his extensive information on the names of birds could be brought together in a single work, but it now seems unlikely that this will be done. The next best course seemed to be to publish a list of the numerous, scattered publications in which Mr. McAtee's data on vernacular names has appeared. Mr. McAtee kindly agreed to prepare the list with explanatory annotations.

The present bibliography covers the period from 1905 through June 1956. It includes 95 entries: 56 on birds, 29 on plants, and 10 on miscellaneous or mixed groups. Related papers by the same author are in press or preparation.

BIRDS

THE HORNED LARKS AND THEIR RELATION TO AGRICULTURE. US Biol. Surv. Bul. 23. 37 p., illus. Nov. 1905.
Several book and 5 popular names.

FOOD HABITS OF THE GROSBEAKS. US Biol. Surv. Bul. 32. 92 p., illus. Feb. 1908.
Records 6 names for the cardinal; proposes 2 ("gray grosbeak" and "parrot-bill") for the Pyrrhuloxia; and notes a Creole name, "blue pop," for the blue grosbeak.

OUR GROSBEAKS AND THEIR VALUE TO AGRICULTURE. USDA Farmers' Bul. 456. 14 p., illus. June 1911.
Rose-breasted grosbeak as the "potato-bug bird."

LOCAL NAMES OF WATERFOWL AND OTHER BIRDS. Forest and Stream 77(5): 172-174, 196-197. July 1911.
For 62 species or subspecies of game birds and 36 nongame birds; indexed. Also issued in separate form.

A BIRD STORY FROM SOUTH CAROLINA. Wilson Bul. 27(2): 350. June 1915.
"Moonshine" for the purple gallinule.

SOME LOCAL NAMES OF BIRDS. Wilson Bul. 99: 74-95. June 1917. (Correction sheet: ibid. 29(3): extra page. Sept. 1917.)
For 158 groups; indexed. All names on hand at the time were presented for bittern and roadrunner. Includes a 4-page "Partial bibliography of local bird nomenclature."

FOOD HABITS OF THE MALLARD DUCKS OF THE UNITED STATES. USDA Bul. 720. 35 p., 1 pl. Dec. 1918.
Vernacular names for the 3 species of the restricted group, Anas.

[ANNOUNCEMENT RELATIVE TO LOCAL NAMES OF BIRDS.] Auk 36(2): 323-324. Apr. 1919.
Plans for a dictionary of them.

NOTES ON FOOD HABITS OF THE SHOVELLER OR SPOONBILL DUCK (SPATULA CLYPEATA). Auk 39(3): 380-386. July 1922.
Three local names mentioned.

LOCAL NAMES OF MIGRATORY GAME BIRDS. USDA Misc. Cir. 13. 95 p., illus. Oct. 1923.
A listing of all names on hand for ducks, geese, swans, cranes, rails, gallinules, coots, shore birds, pigeons, doves, and bobolink; indexed.

BIRDS THAT HAVE NAMED THEMSELVES. Nat. Mag. 11(2): 85-87, illus. Feb. 1928.
Sonic names of numerous species.

SNAKE BIRDS. Nat. Mag. 15(2): 113, illus. Feb. 1930.
Why several species are so called.

THE "FLYING HORSE." Nat. Mag. 19(4): 248, illus. Apr. 1932.
Names for the upland plover.

UNIDENTIFIED BIRD NAMES. Auk 58(1): 134. Jan. 1941.
Appeal for assistance in identifying 51 puzzles from numerous states, which are cited. About 10 of these have since been determined.

POPULAR SUBSPECIES. Auk 61(1): 135-136. Jan. 1944.
Local names indicating belief in distinct varieties of the black duck, mallard, and Canada goose. See correction in Auk 64(1): 147, Jan. 1947.

PRONUNCIATION OF 'WEIR.' Am. Speech 20(1): 76-77. Feb. 1945.
Holboell's grebe called "wear-hen" in Maine.

NAMES FOR THE WHIPPOORWILL. Am. Notes & Queries 5(1): 11. Apr. 1945.
Sound names for this bird in various languages and a few other names for this and related species.

BRANTA C. HUTCHINSI ON THE ATLANTIC COAST. Auk 62(3): 461-462. July 1945.
Local names indicate popular recognition of this subspecies; 17 from 13 places are cited.

INTERIOR RECORDS OF THE BRANT. Auk 62(3): 464-465. July 1945.
These mostly erroneous records are probably based on misinterpretations of the terms "brant" and "black brant," which are discussed.

FOUR NOTES ON AMERICAN ENGLISH. [2] SCOGGIN. Am. Speech 20(3): 230. Oct. 1945.
Suggested derivation of this and another name, "murrel hen," for herons.

A PRONUNCIATION OF 'SEDGE.' Am. Speech 20(4): 306. Dec. 1945.
As in "sage hen," name of the clapper (and sometimes other) rails.

GEORGIAN RECORDS IN JOHN LATHAM'S "GENERAL HISTORY OF BIRDS," 1821-1824. Oriole 11(1): 1-11. Jan. 1946.
Identification of vernacular names of Latham and his Georgian correspondent, John Abbot. Those for 158 species are correlated with modern concepts, while those for an additional 15 are left unidentified.

BIRD FOLKLORE FROM ROANOKE ISLAND, NORTH CAROLINA. J. Am. Folklore 60 (235): 86-87. Jan.-Mar. 1947.
"Red-headed woodcock" for the pileated woodpecker; and "jackdaw" for the boat-tailed grackle.

PHONETICS OF THE PEOPLE. Am. Speech 23(1): 77-78. Feb. 1948.
Sonic names of the American bittern and the kiskadee flycatcher.

THE "CUSSED SPARRER." Am. Notes & Queries 8(5): 69. Aug. 1948.
Derogatory names applied to the English sparrow.

PRIOR AMERICAN RECORDS OF BRITISH WORDS. Am. Speech 23(3/4): 312. Oct.-Dec. 1948.
Examples, with dates, of: duck and mallard, sand swallow, and snow bird.

'PIN' MEANING 'LITTLE.' Am. Speech 25(1): 75. Feb. 1950.
Pin snipe for three species of sandpipers in Texas.

'INHERITANCE' OF A BIRD NAME. Am. Speech 25(1): 75. Feb. 1950.
"Penguin," a name for the great auk, was applied to other sea fowl after that bird's disappearance.

STINK BIRDS. Nat. Mag. 43(7): 390. Aug.-Sept. 1950.
Birds so named because their scent attracts pointing dogs.

THE NORTH AMERICAN BIRDS OF GEORGE EDWARDS. J. Soc. Biblio. Nat. Hist. 2(6): 194-205. Oct. 1950.
The English names in "A Natural History of Birds" (1743-1751) and "Gleanings of Natural History" (1758-1764) are identified so far as possible with modern technical designations.

THE NAME "PRAIRIE WARBLER." Auk 67(4): 520-521. Oct. 1950.
Discussion of this and several other names suggested by the bird's habitat.

GLEANINGS FROM THE DIALECT OF GRANT COUNTY, INDIANA. Publ. Am. Dial. Soc. 15: 51-64. Apr. 1951.
"High-hole" for the flicker; "peedee" for the pipit.

FOLK ETYMOLOGY IN NORTH AMERICAN BIRD NAMES. Am. Speech 26(2): 90-95. May 1951.
Numerous examples, including the falsely labelled deistic names of the pileated and ivory-billed woodpeckers.

BIRD NAMES CONNECTED WITH WEATHER, SEASONS, AND HOURS. Am. Speech 26(4): 268-278. Dec. 1951.

'BASTARD' MEANING HYBRID, IN THE NAMES OF AMERICAN BIRDS. Am. Speech 27 (4): 194-195. Dec. 1952.
For 11 species; notes on mongrel and mule terms and French equivalents of all 3.

RICEBIRDS IN THE CAROLINAS IN 1918. Chat 17(1): 2-3. Mar. 1953.
Three species to which the name was applied and 3 other names for one of them--the bobolink.

'WOODCHUCK' AS A BIRD NAME. Am. Speech 28(2): 145. May 1953.
For woodpeckers and hermit thrush.

LONGEVITY OF BIRD NAMES. Names 1(2): 85-102. June 1953.
General discussion; tabulation of names traceable to the 19th to 7th centuries; many references to literature cited.

UPPER CURRITUCK SOUND, 1910 AND LATER. Chat 17(3): 57-58. Sept. 1953.
Local names for several species of birds.

NAMING WILD BIRDS AS IF THEY WERE POULTRY. Am. Speech 28(4): 276-284. Dec. 1953.
Guineas, chickens, hens, etc.

NORTH AMERICAN BIRD RECORDS IN THE "PHILOSOPHICAL TRANSACTIONS," 1665-1800. J. Soc. Biblio. Nat. Hist. 3(1): 56-60. Dec. 1953.
Names used by 4 authors reduced to modern nomenclature so far as practicable.

ILLUSTRATED BUT UNKNOWN. Nat. Mag. 47(3): 164. Mar. 1954.
Names for 3 species in the hypothetical list of the A.O.U. Check-List of Birds, which though figured by Wilson and/or Audubon, have never been certainly identified.

CAROLINA BIRD NAMES. Chat 18(3): 62-69, Sept. 1954. 18(4): 87-94, Dec. 1954. 19(1): 8-15, Mar. 1955. Also separately published--Raleigh, N. C., May 1955.
Compilation of folk names of the birds of North and South Carolina.

THE WILD PIGEON LEFT SOME NAMES. Am. Speech 29(3): 233-234. Oct. 1954.
To birds that resembled it in part or whole, and to hawks that preyed upon it.

ECCLESTIASTICAL BIRD NAMES IN LOUISIANA--FRENCH. Names 2(4): 269-271. Dec. 1954.
Such as ministre, évêque, cardinal, and pape; also a few other French and Spanish names.

PETER BIRDS. Names 3(1): 26-27. Mar. 1955.
So named from apparently walking on water and for other reasons.

FOLK NAMES OF GEORGIA BIRDS. Oriole 20(1): 1-14. Mar. 1955.
With 9 titles of "Literature Cited."

THE NORTH AMERICAN BIRDS OF VIRGINIA CHRONICLERS, 1588-1686. J. Soc. Biblio. Nat. Hist. 3(2): 92-101. Apr. 1955.
Names recorded by 16 authors are synonymized, so far as practicable, with modern technical nomenclature.

FOLK NAMES OF FLORIDA BIRDS. Fla. Nat. 28(2): 35-37, 64, Apr. 1955. 28(3): 83-87, 91, July 1955. 28(4): 103, 121-123, Oct. 1955 [Feb. 1956]. 29(1): 25-28, Jan. 1956 [March].

FOLK NAMES OF NEW ENGLAND BIRDS. Bul. Mass. Aud. Soc. 39(7): 307-316, Oct. 1955. 39(8): 375-379, Nov. 1955. 39(9): 441-446, Dec. 1955. 40(1): 17-22, Jan. 1956. 40(2): 79-84, Feb. 1956. 40(3): 127-130, Mar. 1956. 40(5): 253-256, May 1956.

FOLKLORE OF BIRDS IN THE SOUTHEAST. Chat 19(2): 30-35. June 1955.
Discussion of the "god"names (cf. Am. Speech, May 1951). Some other local names occur.

BIRD NAMES WITH ANIMAL OR PLANT COMPONENTS. Am. Speech 30(3): 176-185. Oct. 1955.
The plant-inspired terms do not include ecological names such as "birch hen," "sage hen," and the like, which were reserved for another chapter.

THE BIRDS IN LAWSON'S "NEW VOYAGE TO CAROLINA," 1709. Chat 19(4): 74-77, Dec. 1955. 20(2): 23-27, June 1956.

A FEW MORE CAROLINA BIRD NAMES. Chat 20(1): 3. Mar. 1956.

BIRD FOOLS AND BOOBIES. Names 4(1): 46-48. Mar. 1956 [June].

ADDITIONAL CAROLINA BIRDS IN BRICKELL'S ["NATURAL HISTORY," 1737.] Chat 20(2): 27-28. June 1956.

MISCELLANEOUS

NOTES ON CHEN CAERULESCENS, CHEN ROSSI, AND OTHER WATERFOWL IN LOUISIANA. Auk 27(3): 336-339. July 1910.
Delta names for 5 plants fed upon by geese; 4 local names for the mottled duck.

PISCATORIAL ENTOMOLOGY. Can. Ent. 1919: 257-258. Nov. 1919.
A review in which anglers' names for aquatic and a few other insects are discussed.

VERNACULAR NAMES FOR INSECTS. Ent. News 37(8): 269. Oct. 1926.
Suggestion that some entomologist collect them; 5 for gyrinid beetles and a few others are cited.

WHAT DO YOU CALL THEM? Nat. Mag. 34(3): 136-140, illus. Mar. 1941.
Geographical distribution of names for earthworms, whirligig beetles, menhaden, bullfrog, bobolink, and pine needles.

RURAL DIALECT OF GRANT COUNTY, INDIANA, IN THE 'NINTIES. 81 p. Privately printed. Washington, D. C. Nov. 1942.
Includes the local name of one bird (brown thrasher) and one plant (Erigenia bulbosa). A ten-page supplement of esoteric terms has another plant name for the slippery elm.

NOMINA ABITERA. 50 p., 1 pl. Privately published. Chicago, Illinois. 1945.
Intended primarily to collect "off-color" names of birds, which could not be published in the author's large work on bird names that was then projected. (Ironically the "bad" names are published while the others, in their entirety, probably never will be.) The paper was broadened to include vulgar geographic terms, names of plants, invertebrates, fishes, frogs, reptiles, and mammals. It contains also an essay on "god" birds.

POPULAR NAMES OF GYRINIDAE. J. N. Y. Ent. Soc. 55: 205-206. Sept. 1947.
The 5 of Oct. 1926 have grown to 17.

LUCKY BUG. Am. Speech 22(4): 270. Dec. 1947.
Name and folklore of the green tiger beetle.

COMMENTS ON MRS. NIXON'S LIST (PADS 5) AND DR. WOODARD'S LIST (PADS 6). Publ. Am. Dial. Soc. 8: 17. Feb. 1948.
Notes on 3 bird and 4 plant names.

SUPPLEMENT TO NOMINA ABITERA. [11 p.] Privately printed. Chapel Hill, N. C. 1954.
Geographic terms allied to those in the original (1945), and also names for invertebrates, fishes, amphibians, and birds.

PLANTS

THREE IMPORTANT WILD DUCK FOODS. US Biol. Surv. Cir. 81. 19 p., illus. Sept. 1911.
Local names of 2 species of pondweeds.

A LIST OF PLANTS COLLECTED ON ST. VINCENT ISLAND, FLORIDA. Proc. Biol. Soc. Wash. 36: 39-51. Mar. 1913.
Local names of 12 species.

SOME LOCAL NAMES OF PLANTS. Torreya 13(10): 225-236. Oct. 1913.
For 106 species or groups; indexed.

FIVE IMPORTANT WILD-DUCK FOODS. USDA Bul. 58. 19 p., illus. Feb. 1914.
Proposes the names delta duck potato, wild millet, and banana waterlily; lists compiled names for 2 other species.

FURTHER NOTES ON TAMARISK. Science, N. S., 39: 906. June 1914.
Called salt-water cedar in La.

ELEVEN IMPORTANT WILD-DUCK FOODS. USDA Bul. 205. 25 p., illus. May 1915.
Vernacular names for most of the plants; musk grass, widgeon grass, and coontail are proposed for adoption.

PLANTS COLLECTED ON MATINICUS ISLAND, MAINE, IN LATE FALL, 1915. Rhodora 18(206): 29-45. Feb. 1916.
Local names for 38 species.

THE WINTER FLORA OF MUSKEGET ISLAND, MASSACHUSETTS. Rhodora 18(209): 93-99. May 1916.
"Japanese rose" for naturalized Rosa rugosa.

SOME LOCAL NAMES OF PLANTS--II. Torreya 16(11): 235-242. Nov. 1916.
For 80 species; indexed.

PROPAGATION OF WILD-DUCK FOODS. USDA Bul. 465. 40 p., illus. Feb. 1917.
While a revision of previous papers on the subject, this bulletin contains additional vernacular names for the older, as well as some added, species.

NOTES ON THE PLANTS OF WALLOP'S ISLAND, VIRGINIA. Torreya 18(3): 70-71. Apr. 1918.
Local names for Pinus taeda and P. virginiana; also 1 for Baccharis halimifolia.

NOTES ON THE FLORA OF CHURCH'S ISLAND, NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 25: 61-75. Oct. 1919.
Local names for numerous species.

SOME LOCAL NAMES OF PLANTS—III. Torreya 20(2): 17-27. Mar.-Apr. 1920.
For 104 species; indexed.

TRILISA ON THE MARKET. Torreya 24(3): 50. May-June 1924.
Local name in Ga.: "deer-tongue."

SOME LOCAL NAMES OF PLANTS—IV. Torreya 26: 1-10. Jan.-Feb. 1926.
For 55 species; indexed. Contribution of 48 titles to a bibliography of the subject.

SOME LOCAL NAMES OF PLANTS—V. Torreya 33(4): 81-86. July-Aug. 1933.
For 65 groups; indexed. Bibliography of 11 titles.

SOME LOCAL NAMES OF PLANTS—VI. Torreya 37(5): 93-103. Sept.-Oct. 1937.
For 81 groups; indexed.

PLANT NAMES INDICATING UTILIZATION BY WILDLIFE. US Biol. Surv., Wildl. Rev. 12: 22-36, mimeo. Feb. 1938.

JOURNAL OF BENJAMIN SMITH BARTON ON A VISIT TO VIRGINIA, 1802. Castanea 3: 85-117. Jan. 1939.
The plants, for many of which interesting vernaculars of the period are given, are identified.

WILDFOWL FOOD PLANTS. THEIR VALUE, PROPAGATION, AND MANAGEMENT. Collegiate Press, Ames, Iowa. 141 p., illus. 1939.
"Vernacular names of wildfowl food plants," p. 112-122, is a compilation of all names readily available at the time. An index to them is combined with the general index.

WHEN A GRASS IS NOT A GRASS. Nat. Mag. 34(1): 23, 47, illus. Jan. 1941.
Many plants called grasses do not belong to the grass family; numerous examples are given.

SOME LOCAL NAMES OF PLANTS—VII. Torreya 41: 43-55. Mar.-Apr. 1941.
For 187 groups; indexed. Contribution of 31 titles toward a bibliography of the subject.

NAMES OF AMERICAN PLANTS IN BOOKS ON KALM'S TRAVELS. Torreya 41: 151-160. Sept.-Oct. 1941.
In Swedish, German, Dutch, French, and English.

SOME LOCAL NAMES OF PLANTS—VIII. Torreya 42: 153-168. Nov.-Dec. 1942.
For 198 groups; indexed; 36 titles for a bibliography.

PINKSTER. Am. Notes & Queries 5(10): 154. Jan. 1946.
This and allied names for Azalea nudiflora.

PINKSTER. Am. Notes & Queries 6(5): 80. Aug. 1946.
The fungus galls on the plant are called "swamp apples."

SOME LOCAL NAMES OF PLANTS—IX. 16 p. Privately printed. Chicago, Illinois. Oct. 1946.
For 156 groups; indexed; 66 titles for a bibliography.

SOME FOLK AND SCIENTIFIC NAMES FOR PLANTS. Publ. Am. Dial. Soc. 15: 3-25. Apr. 1951.
For 177 groups; indexed; 41 titles toward a bibliography. This may be considered as Part X of the series "Some local names of plants," 1913-1946.

THE LASH-HORN TREE. Nat. Mag. 45(10): 540-541, illus. Dec. 1952.
Abies fraseri: 11 folk and 4 book names.

	Page
Acworth, Bernard	58
Adams, E. V.	33
Agee, Phil	20
Albertson, F. W.	26
Aldous, Clarence M.	48
Allan, Philip F.	74
Allen, E. Ross	85,88
Allen, Rex W.	48
Alley, Harold P.	30
Altmann, Stuart A.	58
Anderson, A. C.	2
Anderson, Roy C.	51
Anderson, Sydney	32,37
Archer, Sellers G.	2
Arden, G. B.	41
Arnold, David A.	47
Ash, J. S.	16
Atkeson, Thomas Z.	45
Atkinson-Willes, George	74
Austin, Oliver L.	63
Austin, Oliver L., Jr.	63
Austwick, P. K. C.	82
Axell, H. E.	64
Babero, Bert B.	47
Bailey, R. Wayne	73
Baker, E. W.	12
Bandy, J.	52
Banfield, A. W. F.	48
Bankowski, R. A.	72
Barry, Thomas W.	75
Batson, Wade T.	6,7,23,24,25
Beach, Frank A.	40
Beach, James E.	17
Bednarik, Karl	44
Beer, J. V.	75
Bell, Roger	30
Berg, Paul F.	75
Bergstrom, E. Alexander	58
Berner, Lester M.	28
Besser, Jerome	34
Betts, Monica M.	16
Bevans, Michael H.	85
Bird, H. R.	70
Bizeau, Elwood G.	62,68,82
Black, Hugh C.	84
Black, Kenneth E.	78
Blaisdell, James P.	25
Blake, Charles H.	58
Blank, T. H.	16
Boeker, Hal M.	75
Bogert, Charles M.	85
Bond, J.	61
Booth, Ernest S.	84
Boucher, R. V.	68
Bowers, N. A.	6
Boyd, Hugh	75,76,78,81,82
Bragg, Arthur N.	86
Brewer, Richard	30
Broun, Maurice	84
Bue, Ingalf Gilbert	76
Bullard, Clifford O.	4
Bullock, Dillman S.	66
Burbutis, Paul P.	35
Burgess, P. S.	26
Burke, Hubert D.	28
Burns, K. F.	33
Buss, Irven O.	61
Butler, M. D.	2
Buttery, Robert F.	48
Byrd, Mitchell A.	24
Calhoun, John B.	32,40
Callenbach, E. W.	68
Campbell, Howard	69
Carlander, K. D.	14
Carvell, Kenneth L.	30
Caslick, James W.	40
Caswell, Herbert Hall, Jr.	61
Chamberlain, E. B., Jr.	78
Chapman, D. G.	14
Chapman, Floyd B.	18,46
Chase, Clarence D.	8
Cheatum, E. L.	51
Chermock, Ralph L.	31
Chiasson, Robert Breton	56
Choquette, L. P. E.	42,47
Christian, John J.	32
Clover, Melvin R.	51
Clovis, Jesse Franklin	26
Cobb, Boughton	7
Coleman, I. A.	17
Collias, Elsie C.	77
Collias, Nicholas E.	77
Connell, C. E.	59
Cook, Alice Richards	77
Cottam, Grant	5
Coulson, J. C.	63
Coulter, L. L.	30
Cowan, I. McT.	52
Craighead, John J.	16
Crisvens, Charles G., Jr.	70
Crissey, W. F.	77
Culberson, William L.	7
Cunningham, John D.	86,88
Cunningham, R. N.	8
Curry-Lindahl, Kai	9,47
Curtis, J. T.	5,7
Dahlberg, Burton L.	51
Dale, Fred H.	18
Dalke, Paul D.	62,82
Daly, C. P.	5
Dasmann, Raymond F.	51
Davidson, John A.	86
Davis, David E.	14,32,41
Davis, R. K.	20,24
Davis, W. B.	44,89
Davis, Wayne H.	34
Day, M. F.	35
Denyes, H. Arliss	9
Derr, H. J.	65
Dickey, Charles H.	19
Dilger, William C.	59
Dixon, Keith L.	63
Dorer, R. E.	41
Dow, Robert L.	64
Drury, William H., Jr.	58
Dumas, Philip C.	86

	Page
Dunnet, G. M.	84
Durham, Floyd E.	37
Dyce, A. L.	35
Eadie, W. Robert	34
Ecke, Dean H.	37
Edwards, R. Y.	37,49,50
Egoscue, Harold J.	37
Ehrenford, F. A.	36
Eibl-Eibesfeldt, Irenäus	56
Eidson, M. E.	34
Einarsen, Arthur S.	77
Einem, Gerald E.	87
Ripper, Alfred W.	84
Eisenmann, Eugene	62
El-Badry, M. A.	15
Elbert, Lucien H.	69
Elder, William H.	77
Elwell, Harry M.	30
Emlen, John T.	41
Engelmann, C.	78
Engels, Wm. L.	59
Enyeart, George	71
Epling, Glenwood P.	49
Erickson, A. B.	53
Evans, Charles D.	78
Evans, T. M.	12
Eveleth, D. F.	54
Fabricius, Eric	78
Farinacci, C. F.	33
Fay, L. D.	33,43
Fellton, Herman L.	41
Fenner, Frank	35
Ferguson, Roland H.	8
Ferris, D. H.	33
Findley, James S.	47
Fischtal, Jacob H.	87
Fisher, Harvey I.	16
Fisher, James	82
Fisher, Kenneth C.	40
Fitch, Frank W.	68
Fitch, Henry S.	38,87
Flakas, K. G.	70
Fog, Jørgen	80
Forward, William R.	78
Fowle, C. D.	43
Fowlkes, Thomas	2
Frary, Ladd G.	78
Fredine, C. Gordon	23
Freeburn, C. C.	18
Freeman, Harry W.	87
Freeman, Reino S.	46
French, C. E.	51
Frevert, Walter	4
Frye, O. Earle, Jr.	67
Fuller, W. H.	26
Fyvie, A.	43
Gabrielson, Ira N.	4
Gallizioli, Steve	67
Garrison, George A.	38
Gehrken, George A.	67
Geis, Aelred D.	69
Gilfillan, Merrill C.	41
Gill, John	52
Gillmor, Robert	79
Goldberg, Aaron	46
Goodpasture, Katherine A.	63
Gould, D. J.	12
Graf, William	49
Graham, S. A.	43,52
Greene, H. C.	7
Greenwald, Gilbert S.	38
Greenwalt, Lynn A.	68
Grice, G. D., Jr.	78
Grieb, Jack R.	17
Griswold, Anne L.	45
Grondahl, C. B.	69
Grove, Alvin R.	30
Grundmann, Albert W.	33
Gudmundsson, Finnur	82
Guettinger, Ralph C.	51
Guilford, H. G.	69
Gullion, Gordon W.	67
Gunn, Charles R.	7
Hacker, Robert G.	43
Hale, Mason E., Jr.	7
Hall, E. Raymond	38
Hamerstrom, Frances	71
Hamerstrom, Frederick	71
Hamilton, W. J., Jr.	34,87
Hammer, Marie	66
Hammond, M. C.	78
Hanlon, Robert W.	20
Hanson, Joe A.	87
Hanson, R. P.	33
Harlan, James R.	89
Harper, Francis	88
Harper, Hugh	70
Harris, G. A.	55
Harrison, J. M.	65
Harrison, R. J.	46
Harter, H. L.	15
Haugen, Arnold O.	47
Hay, Keith G.	43
Hecht, Max K.	88
Helmboldt, C. F.	45
Hendrickson, G. O.	67
Hepting, George H.	26
Herman, Carlton M.	13,68,78
Herrera, L.	15
Herrick, C. A.	69
Herter, Konrad	38
Highton, Richard	88
Hine, Ruth L.	70
Hoffmeister, Donald F.	31
Holdenried, R.	31
Holmer, Matts	79
Holmgren, Ralph C.	25
Honess, Ralph F.	13,49,53,72
Hoover, Robert L.	43
Howard, Milford C.	8
Howard, Walter E.	39,53
Hubbard, E. H.	2
Hull, W. B.	12
Hutchison, O. Keith	8
Ingram, R. H.	51
Irving, Laurence	30
Jahn, Laurence	79
James-Veitch, Elden	84
Jaynes, Julian	40
Jenkins, James H.	73

	Page
Jenner, Charles E.	59
Jessen, R. J.	67
Johnston, David W.	84
Johnston, Richard F.	63
Jollie, Wm. P.	39
Jones, N. G. Blurton	79
Jonsgård, Åge	56
Jordan, James S.	42
Jumber, Joseph F.	84
Junge, C. O., Jr.	14
Kabat, Cyril	70
Karstad, L. H.	33
Kebbe, Chester E.	58
Keefe, Jim	3
Keegan, H. L.	12
Keiss, R. W.	49
Keith, L. B.	36
Kelley, Wm. R.	6,7,24
Kennedy, Cecil B.	48
Kenyon, Karl W.	56,57
King, R. T.	56
Kinney, Alva R.	37
Kirkman, Roger L.	79
Kirkpatrick, Charles M.	35
Kissling, R. E.	34
Kitts, W. D.	52
Klimstra, W. D.	24
Klonglan, E. D.	17
Køie, M.	66
Kolb, Haven	64
Kozicky, E. L.	17,67
Krefting, L. W.	53
Krochmal, Arnold	20
Krog, Hildur	30
Kucera, C. L.	25
Kuhlmann, Karl	53
Laessle, Albert M.	67
Lagler, Karl F.	79
Landram, James F.	53
Latham, Roger M.	73,83
Lauckhart, J. Burton	45
Lauterbach, Gerhard	38
Lawrence, Barbara	57
Lawrence, Donald B.	5
Lawrence, Elizabeth G.	5
Lawrence, W. H.	43
Laws, R. M.	57
Lay, Daniel W.	28
Layton, M. H.	3
Lechleitner, R. R.	31
Lehrer, W. P., Jr.	25
Lehrman, D. S.	11
Leighty, Ralph G.	3
Leonard, O. A.	30
Lewontin, R. C.	15
Lidicker, William Z., Jr.	34
Linde, Arlyn F.	22
Lindroth, Arne	79
Link, K. P.	41
Long, Wm. J.	31
Longhurst, William M.	25,53
Lum, Mary D.	15
Lutz, H. J.	27
Lyon, L. Jack	70
MacDonald, Duncan	43
MacLennan, J. M.	12
Magruder, N. D.	51
Mainland, D.	15
Major, James C.	59
Malewitz, Thomas D.	88
Mangold, Robert E.	35
Mann, Peter M.	34
Mann, Wm. F., Jr.	65
Marien, Daniel	88
Marquardt, Wm. C.	49
Marshall, A. J.	39
Marshall, I. D.	35
Marshall, Robert	10
Martin, Edwin P.	39
Martin, Norman Duncan	62
Martín del Campo, Rafael	85
Martof, Bernard	88
Masson, Vic	66
Matheson, Colin	72
Mathiak, Harold A.	22
Mattison, Helmer M.	61
Mawson, Patricia M.	66
McAlindin, D. P.	41
McAtee, W. L.	5,90-95
McCallion, David J.	88
McClure, H. Elliott	17
McCormack, James F.	8
McEwen, L. C.	51
McLucas, Jim	49
McNally, J.	28
Meanley, Brooke	65,83
Meinertzhagen, R. M.	65
Meise, Wilhelm	67
Meyer, R. K.	70
Miller, Richard S.	31
Mobberley, David George	8
Moisan, Gaston	49
Monson, Mildred	30
Moore, A. W.	38
Morejohn, G. Victor	39
Morgan, James T.	8
Morlan, Harvey B.	31
Morrison, S. M.	49
Mörzer Bruijns, M. F.	80
Moser, Clifford A.	50
Moss, E. H.	8
Mraz, F. R.	68
Mueggler, Walter F.	25
Mullally, Don P.	88
Murie, Olaus J.	65
Murnane, T. G.	33
Myers, K.	35
Myers, Marvin S.	24
Mykytowycz, R.	35
Neal, E. G.	46
Neff, Don J.	43
Neill, Wilfred T.	85,88
Newby, Fletcher	45
Niehuis, Charley C.	3
Nord, Eamor C.	25
Notini, Gösta	79
Ober, Lewis D.	87
Odum, Eugene P.	59
Olson, R. Earl	88
O'Meara, David C.	80

	Page
Omura, Hideo	57
Otterlind, Gunnar	59
Over, H. J.	80
Paludan, Knud	80
Parke, Wesley W.	34
Parkes, K. C.	62
Parmelee, David F.	83,85
Pasto, Jerome K.	55
Patric, Earl F.	29,56
Patten, Bernard C., Jr.	23
Pearson, C. S.	3
Pearson, J. C.	45
Pedersen, Carsten	39
Pengelly, W. L.	4
Penner, L. R.	45
Penney, James T.	88
Petro, James H.	3
Phillips, Richard E.	84
Pimlott, D. H.	42,54
Platt, Dwight	85
Pollack, Joseph A.	87
Poole, W. E.	35
Post, George	72
Preble, Norman A.	39
Progulske, Donald R.	54
Prout, T.	15
Przygodda, Wilfred	12
Quick, Horace F.	46
Rainey, Dennis G.	38
Ramsey, Robert R.	54
Ratcliffe, F. N.	36
Rausch, Robert	45,47
Raynor, Gilbert S.	59
Reed, Clyde F.	88
Remington, J. D.	43
Retzer, J. L.	43
Reynolds, R. R.	27
Rice, Dale W.	85
Richards, S. H.	54
Richards, Tudor	64
Richter, J. H.	5
Rider, P. R.	15
Riney, Thane	20,50
Riordan, Laurence E.	55
Ritcey, R. W.	50
Ritchie, J. C.	8
Robinson, Harry A.	80
Rohrbacher, G. H., Jr.	36
Rosasco, M. Edwin	39
Rosene, Walter, Jr.	68
Ross, Alexander	5
Ross, Ward	41
Rowan, Wm.	36
Rowe, J. S.	27
Rudasill, L. S.	36
Russell, Robert J.	32
Rutherford, Wm. H.	43,44
Salomonsen, F.	65
Schantz, Homer L.	50
Schemnitz, Sanford D.	73
Scherman, Katherine	9
Schevill, Wm. E.	57
Schiller, Everett L.	41,80
Schipper, I. A.	54
Schroeder, C. R.	34
Schubert Kurt	57
Schwartz, Albert	36
Scott, Anthony	2
Scott, J. P.	11
Scott, Peter	76,80,81,82
Scroggin, John B.	89
Segadas-Vianna, Fernando	23
Semones, Vernon D.	70
Senger, C. M.	49
Severinghaus, C. W.	55
Severy, J. W.	4
Shannon, Stanton	26
Sharp, Louise H.	46
Sharp, Ward M.	46
Sharpe, Grant William	27
Shaw, Samuel P.	23
Sheffer, Dale E.	36
Sheldon, Mitchell G.	17
Shelton, Dorothy F.	33
Shepherd, Harold R.	26
Shippee, E. Allen	32
Shumard, R. F.	54
Sillman, E. I.	40
Skellam, J. G.	15
Sladen, W. J. L.	82
Sleptsov, M. M.	57
Smith, A. D.	55
Smith, Donald A.	40
Snow, D. W.	65
Southern, H. N.	37
Southwick, Charles H.	15
Sowls, Lyle K.	18,68
Spärck, R.	66
Sparks, Earl A.	72
Speaker, Everett B.	89
Spencer, Donald A.	29
Spencer, H. J.	41
Spencer, John L.	37
Sprent, J. F. A.	46
Springer, Paul F.	12
Spurr, Stephen H.	27
Stamm, D. D.	34
Standfield, R. O.	43
Steel, Paul E.	62,82
Steen, Melvin O.	19
Stefferud, Alfred	13
Stephens, T. C.	58
Stockstad, Dwight S.	16
Sullivan, Edward G.	47
Sunde, M. L.	70
Sutcliffe, M. I.	15
Sutton, George M.	83,85
Swift, R. W.	51
Swink, F. Nelson, Jr.	33
Swope, H. M.	43
Taber, Richard D.	51
Tansley, K.	41
Tarrant, Robert F.	3,28
Taylor, Walter P.	55
Tener, J. S.	44
Terres, John K.	66
Tester, John Robert	83
Tevis, Lloyd, Jr.	29,40,42
Thomas, D. Woods	55
Thorne, Oakleigh, II.	85

	Page
Tisdale, E. W.	25
Triner, Edward D.	30
Tulloch, Robert N.	23,25
Turček, František J.	64
Turner, Lewis B.	17
Turner, R. B.	55
Tyson, E. L.	78
Uhlig, Hans G.	42
Usinger, Robert L.	89
Venables, L. S. V.	10
Venables, U. M.	10
Vesall, David B.	23
Vest, Dean	33
Vial, James L.	87
Vietinghoff-Riesch, A.	85
Vleugel, D. A.	59,60
von Saint-Paul, Ursula	60
Walker, Ernest P.	17
Wallgren, Henrik	60
Wallmo, O. C.	68
Walton, Bryce C.	46
Ward, Richard T.	28
Warner, John R.	8
Weaver, J. E.	26
Webb, Robert G.	89
Webb, William L.	29,56
Weeden, Robert B.	83
Wehr, Everett E.	68
Weise, Charles Martin	60
Welch, Jack F.	34
Weller, Milton Webster	83
Wellwood, A. A.	40
Westerskov, Kaj	72
Westfall, Claude Z.	48,83
Westman, Hans	79
White, E.	63
Whittle, P.	16
Wichmann, R. W.	72
Wilkinson, O.	39
Williamson, Leslie A.	71
Wing, Leonard W.	14
Winter, Kenneth B.	13
Wislocki, George B.	56
Wolfe, L. R.	62
Wood, A. J.	52
Woodgerd, Wesley R.	17
Wood-Gush, D. G. M.	61
Woodroofe, Gwendolyn M.	35
Worth, C. Brooke	66
Yapp, W. B.	62
Yelverton, Carl Spencer	83
Yocom, Charles F.	83
Young, Stanford	50
Zimmermann, Klaus	40
Zippin, Calvin	16

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